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L. B. CASE'S

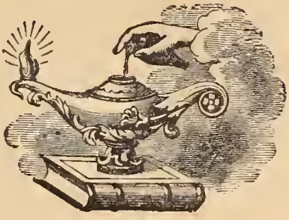
BOTANICAL INDEX,

AN ILLUSTRATED QUARTERLY

BOTANICAL MAGAZINE.

VOLUME I.

TORREY BOTANICAL CLUB. * NEW YORK. *



RICHMOND, IND.,
Published by L. B. Case.
1877-8.

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L. B. Case's
BOTANICAL INDEX,

—TO THE—

NEW, RARE AND BEAUTIFUL
PLANTS,

Grown and For Sale at his Commercial Greenhouses,
RICHMOND, IND.

Vol. 1. APRIL, 1877. No. 1.

TORREY BOTANICAL CLUB. NEW YORK.

OUR AIM AND OBJECT.

With this Number we commence the Quarterly Publication of a list of Plants, Shrubs, Roses, Vines, Ornamental Trees, Bulbs &c. that it has been our good fortune to collect during the past few years of our commercial Green-house business and as our collection is so very complete in some of the specialties, we wish those interested in collecting and growing choice plants to avail themselves of our success as collectors, by ordering from us such plants as they may desire to add to their collection. Many of these varieties are old and very scarce but they are the original or Type species from which so many of our choice Green House and Garden Hybrids originated, consequently no collection is complete without them.

We are anxious to still further increase our list of choice Plants and would be pleased to Exchange plants from these lists at their Commercial value for some of the old but rare sorts not in our collection. and would be obliged to any of our friends who have choice varieties of plants not enumerated in these lists to correspond with us in order that we may obtain from them either by purchase or exchange any of the desirable plants they may have, stating in as explicit terms as possible the variety, size and price of each: however we do not care to add to our stock of unnamed plants unless it is something very choice or curious. for the trouble of obtaining names is often more than the plant is worth.

The names here given are those we received with the plants principally from First Class Commercial Houses and have no doubt that most of them are correct, particularly as we select plants from the most reliable Dealers and often order plants of the same name from several differant establishments if any doubt arises as to the correctness of the names. In addition to our care in purchasing we have had a large portion of the names corrected by some of the best Authority in the country. but with all our care and trouble we can scarcely expect always to be correct when Scientific Botanist still wrangle over some of the numerous plants described and named by different authors, each one giving a distinct name. Again it is almost impossible to obtain access to some of the valuable, rare old authorities especially on exotic plants as the description are usualy published in fragments from year to year in the Transactions of some of the Scientific Societies and never very generally distributed except to kindred societies and the few Scientific Botanist who have won a reputation by their research and discoveries. Although nearly all the plants grown in greenhouses are exotics the change from their native condition, dwarfs their growth, dims the color of both foliage and flower, and of cource changes the whole character from the original description so that the Libraries of choice books would usually be of very limited value in their study,

We propose to issue the **INDEX** quarterly *viz.* January. April. July and October, and send it to all our customers **free**, but the subscription price to all others will be 50 cents a year which is so cheap that of cource we do not expect to realise any profit from its publication, but we consider it the best means, however imperfect of communicating with our customers by giving notes and hints on the growth and culture of the different class of plants we offer for sale, also notices of new plants being introduced both in America and Europe, and any other miscellaneous Botanical information of general interest. We hope our Scientific and Literary friends will remember that this is purely a commercial enterprise and not criticise with too keen an eye our literary efforts.

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CACTUS.

We have devoted one house to the growth and culture of Cactus alone and have succeeded in collecting together about 100 named species and varieties besides several unnamed species. Some of these are entirely new to the trade consequently quite expensive yet. Of the new and scarce varieties our stock is quite limited and mostly young but healthy and well established plants. We feel justified in asserting that our Cactus are as true to name as any collection to be found, because a large portion were named by as good Authority as there is in the country.

L B. CASE'S COLLECTION OF CACTUS.

ORDER CACTIACÆA, Linnæus.

MAMMILLARIA, Haworth.

(Type MAMMILLARIA MAMMILLARIS.)

Ausa.
Bicolor.
Echinus.
Gracilis.
Nivea.
Odieriania.
Pusilla.
Scholynoides.
Sheediana.
Stellata.
Sphærica.
Tenuis.

ECHINOCACTUS, Salm-Dyck.

(Type ECHINOCACTUS MULTIPLEX.)

Emoryi.
Erinaceus.
Eyresii.
Mammillarioides.
Mexicana.
Multiplex.
New Mexicana.
Ottonis.
Simpsoni.
Tuckeriana.
" *Rosea.*
Vallida.

ECHINOPSIS. Zuccarini.

(Type ECHINOPSIS TICHERI.)

Ticheri.
Rholandii.
Zuccerinii.
Vallida.
Pentlandi.

CEREUS, De Candole.

(Type CEREUS GRANDIFLORUS.)

Berlanderi.
Bl aqui.
Bonplandia.
Cylindricus.
Crenulatus.
Erisophorus.
Findleri.
Flagelliformis.
Formosum.
Grandiflorus.
Gigantea.
Jamaicaei.
Lootuosum.
Longissima.
Maritima.
Martini.
Mc Donaldii.
Monstrosum.
Muldiana.
Paucispinus.
Trocumbens.
Repens.
Serpentinus.
Senile.
Speciosa.
Speciosissimus.
Tetragonus.
Tortuosus.
Triangularis.
Turpini.

EPIPHYLLUM, Haworth.

(Type EPIPHYLLUM TRUNCATUM.)

Grahamii.
Truncatum.
Hybrida.
Violaceum.
Vanderexii.

PHYLLOCACTUS, Haworth.

(Type PHYLLOCACTUS PHYLTANTHOIDES.)

Ackremani.
Hookeri.
Phyllanthus.

OPUNTIA, Tournefort.

(Type OPUNTIA VULGARIS Miller.)

Alba Spina.
Arborescens.
Brazilicus s.
Ficus Indica.
" *Atropurpurea.*
Flaccida.
Kleinii.
Maxima.
Mexicana.
Microdasys.
Missouriensis.
Prolifera.
Rafinesqui.
Rufida.
Serpentinus.
Trichophorus.
Tuna.
Vulgaris.

NOPALEA, DeCandole.

(Type NOPALEA [Opuntia] COCHINILLIFFERA.)

Cochinillifera.
Digara.

RHIPSALIS, Haworth.

(Type RHIPSALIS PENDULA.)

Flava.
Serpentina.
Salicornoides.

PERESKIA, Plumier.

Pereskia Aculeata.

BEGONIA.

WE have taken an especial pleasure in collecting together what we think to be an unequaled variety of BEGONIAS, in fact it has almost decome a hobby with us, but we have found them to be the most serviceable plants for house culture yet offered as they thrive so well in a shady room which they are almost sure to find in an ordinary dwelling. We prefer the Zoned or Silver leaf varieties to all others for house culture because their foliage is always attractive and when the plants are well matured they bloom very freely, especially during winter; but the HOT-HOUSE varieties are very difficult to grow to perfection except in a hot and moist green-house and although their highly colored foliage is very tempting to the Amateur, they are not likely to succeed in growing them into choice plants. But for bloom the Shrubby varieties are the best either in the house during Winter or planted out in a shady place during summer.

Our list of BEGONIAS comprise over 100 varieties most of which are quite distinct but a few are GREENHOUSE HYBRIDS and are often only distinguished from the original species by the brighter color and more distinct markings of their foliage. This multiplying of specific names for seedlings of such doubtfull charactors is the source of much confusion to the collector and and is never quite satisfactory to the Botanist even in his studies. In our efforts to secure correct names for the foliage varieties we have purchased plants from a great many dealers and from some of the most reliable ones we have purchased *Begonia Duchesse d' Brabandt* under the name of *Begonia Rex, Philadelphia, Pruenosa and Nebulosa* and an equal number of distinct varieties under the name of *B. Rex*, but after a carefull study of all the varieties we think we have identified the different ones in our collection, at least to our own satisfaction.

(For culture, treatment and description of BEGONIAS see our Annual Illustrated plant Catalogue especially for 1876 sent free to all applicants upon receipt of stamp. Price of plants not in our regular Catalogue given on application.)

L. B. CASE'S COLLECTION OF BEGONIAS.

ORDER BEGONIACEÆ, Linnæus.

REX, or ZONED VARIETIES.

(Type BEGONIA REX.)

Apollo.
Argentea Punctata.
Centennial.
Duchesse de Brabandt.
Eldorado.
Decaisneana.
Ella.
Emma.
Humboldtii.
Hydrocotylifolia.
Inspector Otto.
Jennie.
La Favorite.
Lady Stuart,
Longifolia.
Lord Palmerston.
Lucy Heaver.
Mad. Terrier.
Mad. Revere.
Miranda.
Miss Helen Buist.
Mrs. Stewart Lowe.
Minnie.
Nebulosa.
Philadelphia.
Picturata.
Pres. Van Der Heil.
Prince. Albert.
Pruenosa.
Quadricolor.
Queen of Hanover.
Rex.
Rex Magnifica.
Rosedale.
The O'Donohue.
Tryphilla.

SILVER LEAF VARIETIES.

(Type BEGONIA SPLENDENS.)

Argentea.
Argentea Hybrida.
Elegans.
Emerald.
Eximia.
Grace Fahnestock.
Grandis.
Imperiator.
Inimitable.
Louisa.
Louis Switzer.
Mad. Alwerdt.
Mad. Wagner.
Marshalii.
Marmorata.
Marginata.
Queen Victoria.
Reichenhamia.
Silver Chain.
Silver Queen.
Splendens.

HOT-HOUSE VARIETIES.

Aug. Sunderbruch.
Carolinæfolia.
Dædalea.
Frederic Seigmeyer.
Griffithii.
Imperialis.
Knerkii.
Roi Leopold.
Schœne Von Oberyenne.
Smaragdina.

SELF-COLORED LEAF VARIETIES.

Capensis.
Feastii.
Glaucophylla Scandens.
Heraclifolia Nigricans.
Leopold 1st.
Manicata.
Ricinifolia.
Ricinifolia Maculata.
Rollinsonii.
Verschaffeltii.

TUBEROUS-ROOTED, DOUBLE FLOWERING VARIETIES.

Balsaminæflora.
Glorie de Nancy.
Gibsonii.
Leomeini.
Salmonea plena.

EVER-GREEN SHRUBBY VARIETIES.

Alida.
Argyrostigma Picta.
Carminata.
Digswelliana.
Falcifolia.
Foliosa.
Fuchsioides.
Fuchsioides Alba.
Hybrida Multiflora.
Incana.
Incarnata.
Incarnata Variegata.
LaPeyrousii.
Nitida.
Odorata.
Oilifolia.
Palmata.
Parnelli.
Parvifolia.
Richardsoni.
Sanguinea.
Saundersii.
Semperflorens.
Sedeni.
Washington.
Zebrina.
Sub Peltata Nigricans.

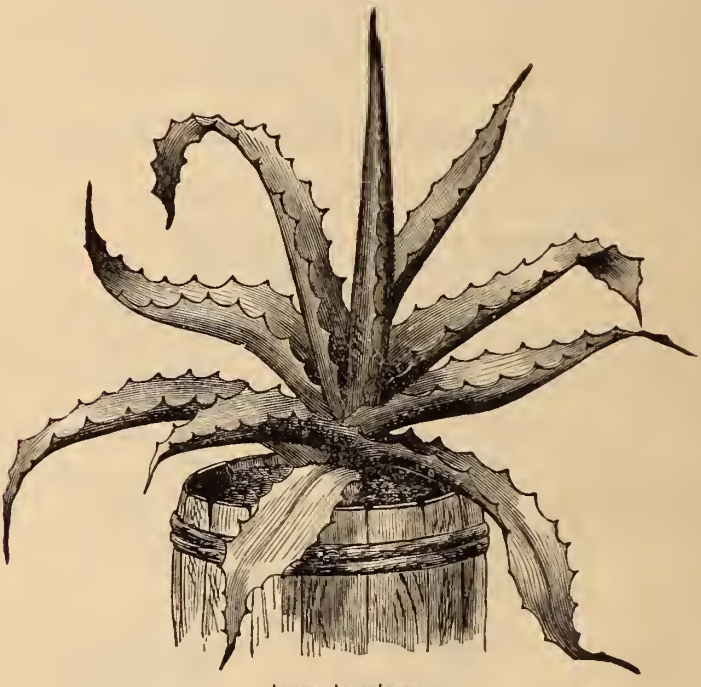
TUBEROUS ROOTED SHRUBBY VARIETY.

(Type Begonia Discolor [Evansiana,] Linnæus.)

Boliviensis.
Chambersii.
Discolor.
Diversifolia.
Dreggii.
Rosæflora.
Sutherlandii.
Veitchii.
Weltoniensis.

TUBEROUS ROOTED REX VARIETY.

Froebeli.
Pearceii.



Agave Americana.

AGAVE.

Probably no plant in cultivation is more entitled to the appellation of "Lawn Plant" than the Agaves, so called American Aloe or Century Plant. They are too common to need any description but a few words on their culture may not be amiss. All the species thrive well in rich, loamy soil, mixed with a little well rotted Cow manure and decayed vegetable mould, but they require plenty of drainage, consisting of broken pots or brick rubbish with plenty of Sun and very little water during Summer, but care must be taken not to allow water to stand on the leaves while exposed to the hot rays of the Sun, as it burns the leaves badly. During winter they require no water and will keep in a cool dry celler.

Last spring we tried an English plan of repotting large Agaves which is so very satisfactory and at the same time was so easily done that we would recomend its adoption by all those who may have large Agaves to repot. After prepareing a tub or pot of earth suitable for their use, we cut off the plant close to the ground and set it upon the newly prepared soil and in a short time new roots had formed, and by fall the pot of earth was full of healthy, young roots, while the plant had made a more vigorous growth than any other Agave in our collection. Agaves must not be repotted in the fall for Winter is their season of rest and nothing must be done to excite the roots into an unnatural growth at that time.

Agaves are long in arriving at a mature or flowering condition, consequently retain their symmetrical form, if well grown for a great many years. They flower but once, the mature condition being attained at a very indefinite period ranging from 10 to 70 years, according to the treatment and condition of the plant but having acquired maturity the flower stem is produced from the center of the tuft of leaves and in some species grows to the heigth of even 40 feet in a very few weeks at the rate of about 5 inches a day and is litterally covered with erect, yellowish-green flowers which remain long in perfection. In 1760 a single plant at the Royal Botanical Gardens Friedricksberg, in Denmark developed more than 4 000 flowers. The first variety of the Agave known to the civilized world was the *Agave Americana*, the so calle American Aloe and taken to Europe in 1561 from America, and the first one to flower in cultivation was in 1662, since then not only have hundreds of *Agave Americana* been taken to Europe, but many new and choicer varieties and species have been introduced, while many choice Hybrids have been added to the list of Agaves. All the true species of Agaves are from Tropical or Sub-Tropical America. but by far the largest number of Hybrids have originated in France and Belgium. Humboldt designated the Agave "the mine of Mexico" from the great variety of uses the natives made of it. In the thickly inhabited portions of Tropical America the Agaves, called Mescal, Maguey, Meti, Theo-meti, Pittes, Sequa-meti, Aca-meti &c. by the various native tribes are very extensively cultivated for the support of the human family, but in the more sparcely-peopled portions nature in her abundance furnishes the required supply, some of the species being common everywhere in Equinoctial America, from the plains to an elevation of 10 000 feet above the sea.

While the Agave is one of the most ornamental plants with us, it is also one of the most useful products of nature in its native country. The leaves supply an impenetrable thatch for their dwellings. Pins and needles are made of the thorns at the end of the leaves. The bruised leaves afford a paste of which paper is made, somewhat resembling the Egyptian Papyrus which when properly dressed and polished is said to have been more soft and beautiful than parchment. Some specimens of their manuscript still in existance exhibit their original freshness and the paintings on them retain their brilliancy of colors. The centre of the flower stem split lengthwise is said to form no bad substitute for a European razor-strop on account of the particles of silica it contains. The roots as well as the leaves furnish a strong fiber or thread that is extremely tough and is used for makeing ropes, and spans for bridging the mountain chasms of Tropical America, it is also used during the past few years in manufacturing a fabric that has the appearance of linen lace. From the leaves a juice is expressed which with the addition of lye from wood ashes makes a very desirable soap forming a lather in salt water as well as fresh. From the Mexican Agaves especially *Agave Americana* is obtained a sap by cutting out the inner leaves of the plants just before the flower stem is ready to burst which makes a fermented liquor. About 150 gallons of sap is produced in a season of 4 or 5 months from a vigorous Plant. At first the sap has a sourish taste and when mixed with sugar and water makes a cooling drink called Tepache, but it quickly ferments on account of the mucilage and sugar it contains. when it has the taste of cider, but the oder of putrid meat and is then called Palque. Europeans who can overcome the aversion to the fetid oder prefer the Palque to any other liquor while the natives universaly esteem it the choicest of liquor. When allowed to ferment still further it turns to Vinegar and if boild down becomes Syrup. From the Palque a very intoxicating Brandy is obtained. But the greatest importance of the Agaves is its usefullness in furnishing food at all seasons of the year. In its native country the flower stalk shoots up about the first of July and is very tender, juicy and sweet, much resembling the pith of the sugar cane, it is then collected and prepared as a food and called Mezcal : in which condition it will keep preserved for several months. The heart or central part of the older plants that have not yet come to maturity is also collected and used as food ; the most tender portions being at the base of the inner leaves. Plants can be found at all seasons of the year in a proper stage of development to secure as food, which is prepared by roasting in a temporary oven made of earth and stones, requiring about two days to cook it sufficient for use. The roots when properly cooked are converted into a tolerable palpatable and nutritious food. The fresh leaves cut into slices are often used as food for cattle.

L. B. Case's collection of Agaves.

Order **AMARYLLIDACEÆ.** Linnæus.

(Type Agave Americana, Linnæns,)

Altorianum.
Americana,
-- *Variegata.*
Applanata.
Celestina.
Densifolia.
Deserti.
Kerchorei.
Mexicana,
Muleri Picta.
Ortgesta.
Parryi.
Salmianea.
Sislandi.
Verschaffetti.
Virginica.
Xylinacantha.
-- *lineata.*
Yuccafolia.

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L. B. Case's

Wholesale Price List of Plants by the Dozen.

It is always customary to make a reduction in the price of any merchandise sold by the quantity, but in the Plant Trade this rule usually applies to dealers only, however nearly all Nurserymen and Florists make a very liberal discount to those ordering a large quantity of plants each time, either for their own use or to a number of persons clubbing together and ordering all they want as one order and sent to one address. Recognising the justice of this rule we have prepared the following Price List of House and Bedding Plants to be sent when ordered by the Dozen and to one address at the prices named, but at these low prices we cannot afford to let our customers select the choicest kinds only from each class, neither could we undertake to keep the several parts of a club order separate, but we label each plant as it leaves our Establishment and no trouble need be experienced by Clubs in separating their plants even if sent in one package and to one address. The varieties will be our selection of sorts, but will include a good proportion of newer sorts from our entire stock. The plants will be ready to set out in the ground when received, and usually from 3 inch pots but if any one wishes their plants shipped in pots the price of the pots must be added to the prices here given. No order for less than 12 plants of each class filled at these rates, but when less than 12 plants are wanted they can be selected from our Annual Plant Catalogue at retail prices, but we always add some plants to help pay Express charges.

Bedding Plants.

Achyranthus,-7 varieties	$00	75
Alternanthera,-6 varieties (tri-colored foliage)		75
Artemisia,-3 varieties	1	25
Basket Plants,-assorted,-our selection		75
Caladium Esculentum & Bataviensis	2	00
Canna Indica,-8 choice, hybrid varieties	1	50
Chrysanthemum,-Japanese & Pompone	1	50
Coleus,-golden and velvet or dark leaf varieties	2	00
Columbine,-5 varieties	2	00
Dahlias in great varieties	1	50
Euonymus,-4 good varieties our selection	2	00
Fuchsias,-double and single mixed, our choice	1	50
Geraniums,-double and single, all colors, our sel'.	1	50
Gnaphalium Lanatum & Variegatum	1	25
Heliotropes,-12 choice new varieties	1	50
Hibiscus,-10 new & rare kinds, double & singl.	4	00
” older varieties	2	00
Hydrangea Hortensis & Paniculata	2	00
Ivies,-American, English and Russian	1	50
Jasminum Nudiflorum & Officinale	1	00
Lnatana,-8 fine, distinct varieties	1	25
Myrtle,-(vinca) 6 running varieties	1	25
Plumbago Larpentæ	1	75
Roses,-Hybrid Perpetual and Moss	2	5
” Teas, Bourbons and China or Daily	2	00
Salvias,-6 good varieties	2	00
Tuberose,-Double flowering, dry bulbs		75
” Pearl; new, dwarf, double	1	25

Plants by Mail, Postage pre-paid.

In order to place our plants within reach of every one, especially those who do not live near an Express office we have prepared a list to be sent by mail postage paid. in lots of 5 or 10 plants upon receipt of $1.00. The list of 5 for $1.00 are choicer and rarer plants, but the 10 for $1.00 are all good varieties and worthy a place in any collection.

I will send to any part of the United States or Canada FREE of postage my selection of varieties, but all good kinds.

5	*Varieties of Peperomas*	*For*	*$1.00.*
5	*Double Petunias.-extra fine*	*For*	*1.00.*
5	*Distinct varieties of Moss or Lycopodium.*	*For*	*1.00.*
5	*Beautiful Dracænas.*	*For*	*1.00.*
5	*Choice Echiveras.*	*For*	*1.00.*
5	*Amaryllis bulbs.*	*For*	*1.00.*
5	*Varieties of Stapelias.*	*For*	*1.00.*
5	*Choice variegated Ivies.*	*For*	*1.00.*
5	*Fancy Caladiums.*	*For*	*1.00.*
5	*Distinct Aloes.*	*For*	*1.00.*

10	*Ever-Blooming Roses*	*For One Dollar*
10	*Rex Begonias*	*For One Dollar*
10	*Flowering Begonias*	*For One Dollar*
10	*Choice Geraniums*	*For One Dollar*
10	*Beautiful Ferns*	*For One Dollar*
10	*Magnificent New Coleus*	*For One Dollar*
10	*New Lantanas*	*For One Dollar*
10	*Distinct Varieties of Cactus*	*For One Dollar*
10	*Euonymus (five varieties)*	*For One Dollar*
10	*Gladiolus,*	*For One Dollar*
10	*Varieties of Salvias*	*For One Dollar*
10	*Choice (different varieties) hardy vines*	*For One Dollar*
10	*Different varieties tender vines*	*For $1.00.*
10	*choice varieties Cannas,*	*For 1.00.*
10	*Plants in 5 varieties, Bouvardias*	*For 1.00.*

Or the entire set, about 150 varieties, Express charges paid for $20.00.

Remember when ordering to give your name and post office address in full, and make all remittances by post office order, registered letter or New York draft. Send stamp for Illustrated Catalogue.

We propose to issue the INDEX Quarterly, and to all our customers it will be mailed free, but the subscription price to all others will be 50 cents a year, payable in advance.

Direct all letters and orders to

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ALWAYS ON HAND.

FINE PLANTS for HOUSE and GARDEN CULTURE.

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FINE, NEW ROSES AND FLOWERING-SHRUBS.

Dutch Flowering Bulbs

AND

Tuberous - Rooted Plants for Fall Planting.

&c. &c. &c.

At prices to suit these hard times.

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CUT FLOWERS, FLORAL DESIGNS AND all kinds of

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Richmond, Wayne Co., Indiana

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—TO THE

NEW, RARE AND BEAUTIFUL
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Grown and For Sale at his Commercial Greenhouses,
RICHMOND, IND.

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LAWNS AND LAWN PLANTS.

It is our purpose to devote each number of the Index to a general review of that portion of the season in which it is issued, and to what is particularly interesting to Floriculturist or Amateur interested in the growth and culture of Plants, Roses, Shrubs, Bulbs, &c., at the appropriate time. With this object in view, we devote this number to a talk about Lawns and Lawn Plants in particular, for this is the season when every lawn should be kept in the cleanest and most showy condition possible. The Spring months are favorable to the flowering of hardy Shrubs, Roses, Bulbs, and most of the hardy plants, but by July they are nearly all past their beauty, and now when hot weather commences in earnest is the time to bring out the glory of the hard wooded plants.

The accumulation of a large quantity of plants, kept in fine foliage or flower, is always a beautiful sight; but the fine effect of grouping together different colors in the most appropriate place, or the arranging of rare and choice trees, shrubs or plants on the lawn, is as much of a study as the skill of the architect in arranging and planning a large structure. Very few people seem to comprehend the truth of this statement; and although they are often dissatisfied with their own efforts at landscape gardening, they consider the price demanded by a landscape gardener for laying out the grounds as exorbitant and unjust. It is always necessary to exercise the greatest care in selecting appropriate plants, shrubs, &c., but the great point to be attained is a correct and artistic disposition of material after the purchase is made, and this can only be done by one who has studied the effect of massing, grouping or isolating choice plants on a lawn.

In decorating a large lawn there is nothing to be obtained that will give it so much of a finished appearance as large tubs of *Palms*, *Dracænas*, *Tropical Shrubs*, &c., either ngly or in groups; however, very few people are prepared to keep such large plants ver winter, or if they do have a conservatory, the wish to grow so many flowering lants during winter is often gratified to the injury of the foliage of the specimen [illegible] In the list of lawn plants, the Palm always stands first, but it is not neces- [illegible] purchase the most costly ones to produce the greatest effect, for some of the [illegible]mmon varieties are to our notion the best. We will name a few that are easily [illegible]uite hardy for Palms and sold at moderate prices: *Cycas Revoluta*, (so-called [illegible]): *Phœnix dactylifera*, (Date Palm); *Phœnix Tenuis; Latana Borbonica*, [illegible]; *Corypha Australis; Chemærops humilis; C. excelsa; Seafourthia elegans;* [illegible]*imentosa.* The leaves of all these are quite large, strong and not easily [illegible] by wind, hence they are the most serviceable for out-door or lawn decora- [illegible] We say they can be obtained at moderate prices, but every year the nurseryman [illegible] a plant he adds to the cost of it, and to purchase large, old plants that [illegible] been grown for several years in a greenhouse, the cost of growing requires a [illegible]od round price to remunerate the nurseryman for the outlay. And now while we are talking about the price of plants, let us look at the prices asked by our English cousins for choice plants. In William Bull's catalogue, we find he sells choice *Ferns* from 8 to 70 guineas ($40.32 to $352.80), the usual price being 18 guineas ($90.72) each; for *Palms* his prices range from 7s. ($1.68) to 8 guineas (40.32), the usual price being 4 guineas ($20.16) each; *Caladiums*, old varieties, from 3s. to 5s. (72c. to $1.20) each, new varieties, 10s. ($2.40) each. In James Veitch & Son's catalogue, we find some of his choice plants at 105s. ($25.20) each; some at 84s. ($20.16) each, and plenty at 48s. ($11.52) each. Of course these prices are for choice plants, and can only be purchased by the wealthy, but those that are able to indulge in new and costly plants always have conservatories well filled with everything obtainable that is choice and rare, and to correspond they seem to require costly plants on the lawn. However, it is not necessary to keep large plants to decorate the lawn, for well arranged beds of *Coleus*, *Scarlet Geraniums*, *Verbenas* and *Heliotropes*, or clumps of *Cannas*, *Caladiums*, and other large leaf and large growing plants, produce as fine effect as can be wished for. We do not name any of the *Annuals*, because they are so late in maturing that the season is too far advanced before they make any show; but later in the season, as cool weather sets in, they will make a very creditable display.

OLEANDER. (NERIUM.)

THE *Oleander* is one of the commonest house or lawn plants to be met with in the Northern United States, and as it is the easiest and most satisfactory hard wooded plant in cultivation, it is doubly valuable to us at a latitude where choice evergreen and everblooming plants can only be grown and kept at a great deal of trouble and considerable expense. But in the Southern States, where frosts are seldom or never seen, it would be time lost if devoted to so common a shrub or tree as the *Oleander*. The *Oleander* flowers freely during the whole summer, and if kept warm, moist, and in a light and airy situation, produce flowers quite freely during winter. Some of the varieties are said to bear forcing remarkably well, if kept in a hot, moist and light greenhouse. But light and air are indispensable to the successful treatment of the *Oleander*, as well as nearly all hard wooded plants, and moisture is just as essential as heat or light. The generic name, *Nerium*, is derived from the Greek word, *neros*, signifying humid, warm and moist, in allusion to the habitat or natural localities where they were found growing wild. *Nerium Oleander*, and its varieties, are from Southern Europe and Palestine, where they are called Rose Bay, or Sea-side Bay, and grow to the height of 10 or 12 feet, usually producing single rose-color, or occasionally white, odorless, saucer-shaped flowers, but from the fact of their bearing such large clusters they are extremely showy. No definite date is fixed to the cultivation of the *Oleander* in Europe, probably owing to its being a native of the Mediterranean basin, but without doubt 200 years may be assigned as the utmost limit, and perhaps half that time would suffice. No doubt the original specimens selected for cultivation were plants of the finest character, producing the largest and most double flowers; but since the perfection of the science of hybridizing, such improvement has been made in the old varieties that now we have quite a respectable list of choice and new varieties of colors.

We are often disappointed with new, high-priced plants, while they are young and small, for after reading the nurseryman's glowing description we are led to expect something grand and wonderful, which should never be expected in the *Oleander*, especially while the plants are yet small. So we may not be surprised to see flowers on small plants of some of the new varieties, at first single or with only a faint effort at additional petals; but as the plant matures the true character of the flowers will be more perfectly developed. As a rule, the pink or red varieties are the most double, while the white and yellow ones are only semi-double, consequently quite unsatisfactory.

Nerium Odorum, the choice fragrant variety, is a native of India, where it is found in swamps or jungles, but is seldom seen in cultivation. It grows only about 6 feet high, and, like the *Nerium Oleander*, produces pink or white flowers; but unlike the *Oleander*, they are very fragrant. All the *Neriums* contain a formidable poison in the sap—a gallic acid—which is more or less extensively used by the native practitioners in the treatment of human diseases. It has also been introduced into medical practice in Europe and America during late years, with great success. In India, the leaves and bark of the root of *N. Odorum* are applied externally, as a powerful repellant in cases of tumors. It is also used in hot countries as a destroyer of cutaneous vermin, those scourges of the tropics that are so annoying to Europeans. But while it contains beneficial medical qualities, it also contains a deadly poison, and care should be taken to not allow even the leaves or broken branches to be placed where children can get them, for they are always sure to eat whatever they happen to pick up, and the moisture contained in the leaves would prove fatal. It is related that while the French troops occupied Madrid, a marauding soldier cut some branches of the *Nerium Oleander* to use as a spit upon which to roast his plunder, and of the twelve comrades who partook of the feast, seven died and the other five were dangerously ill. It is also just as destructive to stock, as many a farmer has long since learned to his sorrow.

We are accustomed from our childhood to see the *Oleander*, and being always familiar with it we see nothing peculiar in its form or growth; but if we stop to study it carefully we will soon see that, unlike nearly all other shrubs, the leaves are arranged in threes, in a group or whorl at the same height on the stem, and the leaves that constitute the whorl correspond with the space that separate the leaves in the whorl immediately above or below, and the leaves of a pair are always equidistant, especially in well grown plants as well as in their natural condition; but often in the cultivated specimens, poor soil, irregular watering and general neglect have changed these characters to a limited extent. The branch is always formed by the development of the bud, and this bud originates in the axil of the leaf, consequently in the *Nerium* we have three branches always starting from the same height on the stem, which if allowed to grow on young plants forms a clump of ungainly appearance; but by pinching out all unnecessary young shoots, the strength and vitality of the plant is conveyed through the remaining branch, and in a very short time the branch will assume a horizontal or upright position, and in a few years the growth will entirely obliterate the knots or joints formed at the junction of the branch and main stem. The end of a mature branch is always terminated by a bunch of flowers, and maturing either by ripening seed or by the flower withering, the flower stem withers up and drops off back to the first whorl of leaves. From here again starts the new growth in threes, so that in a very short time the tree becomes dense, which prevents the circulation of light and air.

Nearly every amateur in the country has tried his or her skill at propagating the *Oleander*, by cutting off the end of a branch and placing it in a bottle of water until roots have formed, when it is ready to pot off. It is one of the easiest plants to propagate, and success nearly always attends the undertaking. Most people grow them in boxes, tubs or pots from the time of first taking root, but it is always best to grow them the first year after cuttings are rooted in the open ground, as they grow so much more robust and strong, and usually attain a height of three or four feet before blooming, and there is no objection to allowing them to branch out after they have reached that height. When taken up from the open ground, all possible care must be taken to prevent the ends of the branches from withering. This can be helped to a large extent by thoroughly soaking the ground with water for a few hours before taking up, and after lifting by keeping the plants in a cool, shady place for a few days, with plenty of water on both foliage and roots. Indeed, we never found any trouble in lifting *Poinsettas*, *Bouvardias*, and many other hard wooded plants, in the hottest weather of August and September, by carefully attending to them.

After plants have grown to near the size required, the ends of the branches may be cut back to reduce the size as well as to keep the plant in a good shape, which may be done either in spring or fall; but if done in summer, it would be liable to cut off branches that soon would bloom.

Plants should not be re-potted in the fall or winter, and during winter should have very little water. This is necessary to prevent the earth from getting sour.

L. B. CASE'S COLLECTION OF OLEANDERS.

Order--APOCYNACEÆ.

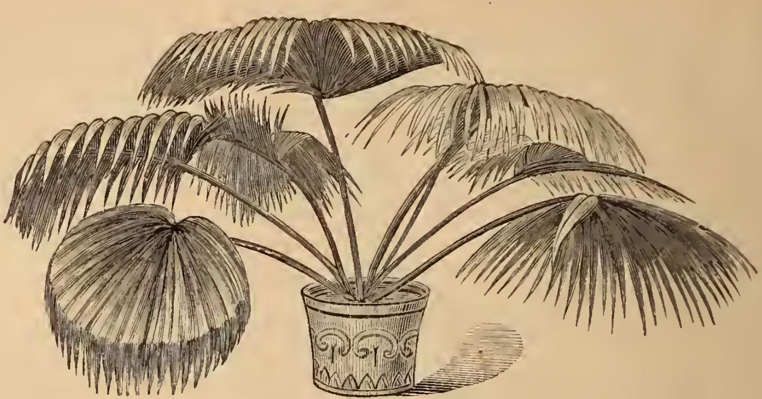
TYPE—*Nerium Oleander. Linnæus.*

Oleander.
“ *album.*
“ “ *duplex.*
“ “ *maximum.*
“ “ *plenum.*
“ *atro-purpureum plenum.*
“ *atro-sanguinea.*
“ *de Brun.*

Oleander flavum duplex.
“ *Geant des Battles.*
“ *Henri Mares.*
“ *Henri Sahut.*
“ *luteum.*
“ *Madonna grandiflora.*
“ *Paul Sahut.*

Oleander Prof. Durand.
“ *punctatum plenum.*
“ *purpurea plena.*
“ *rosea.*
“ *Shaw's Seedling.*
“ *splendens.*
“ *Such's New Double White.*

An Important Contribution to American Botany.—S. E. CASSINO, of Salem, Mass., has commenced the publication of a work on *Ferns*, that will supply a long wished for text book to the student of these beautiful plants. The text will be prepared by Prof. DANIEL C. EATON, of Yale College, who has the largest herbarium of *Ferns* in America, with assistance by Mr. J. ROBINSON, GEO. F. DAVENPORT, CHAS. E. FAXSON, Mrs. COOPER, of Santa Barbara, and others, while the drawings will be from the pencil of Mr. J. H. EMERTON. The work will be issued in parts, at $1.00 each, about once in three months.



Latania Borbonica.

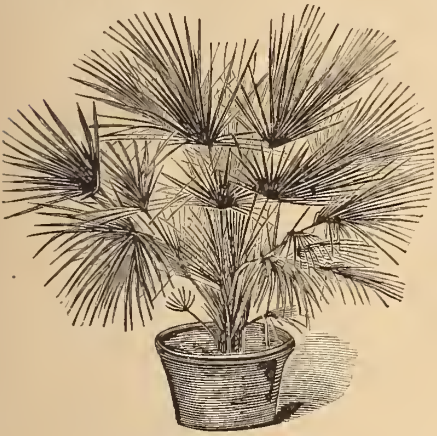
PALMS.

LINNÆUS very justly calls the Palm the "Prince of the Vegetable Kingdom," for nothing can equal the grandeur of the Palm groves in their native country; add to this the fact that no other single family of plants furnish all the necessaries of life to half as many of the human family as the Palm. But to enumerate the necessaries, comforts and luxuries derived from the Palm, would nearly complete the list of wants. From nearly all the species a delicious fruit is obtained that forms a very important article of food to the natives; indeed, the *Date* may be said to form the principal subsistence to most of the inhabitants of Arabia and Northern Africa. But it is not the fruit alone that is so beneficial, for nearly every part of the tree is applied to some useful purpose. The fiber surrounding the bases of their stalks is used for making ropes, cloth, and sails for their boats; the wood for building; the leaves for covering their homes; the heart of young growth is eaten as a vegetable; the sap affords an intoxicating wine, though to obtain it the tree is killed; and even the hard and apparently useless stones are ground into food for their camels.

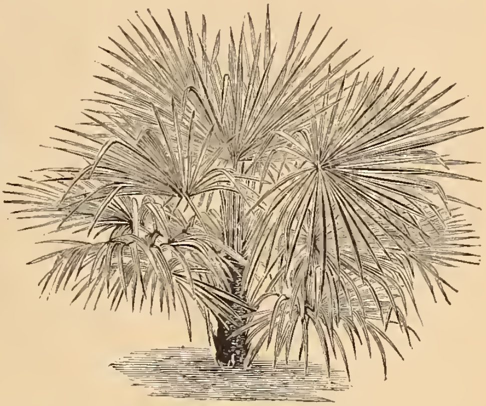
The Cocoa-nut Palm, *Cocos uncifera*, furnishes food, clothing, material for their homes, utensils of various kinds, rope, sail, cloth, and oil for food, to the inhabitants of the East India Islands. Nearly all the African Palms yield the liquid known as palm oil, which is not only used by the natives as food, but is one of the principal articles of export to Europe from the east coast of Africa, where it is extensively used in the manufacture of soap. The oil is obtained principally from *Elæis guineensis*, and is procured by bruising the fruit, which is about the size of the olive and of a golden yellow. The famous Betel Nut is the product of *Areca Catechu*, and is prepared by cutting the seed of the *Areca* in slices, powdering with chalk, and enclosing in the leaf of the Betel pepper. The natives chew it for its stimulating or intoxicating properties. The finest Sago is obtained from *Sagus lævis* and *S. Rumphii*, found in the eastern islands of the Indian Ocean, but many other Palms produce Sago. The Date Sugar of Bengal is the product of *Phœnix sylvestris*. The best Wax Palms are natives of Brazil, where they grow to the height of 200 feet. The *Ceroxylon* is covered with a coating of resin-like wax. *Calamus Rotang* is a prominent article of commerce, under the name of Rattan. *C. Scipionum* is also largely used under the name of Malacca Canes. The *Calamus* grow to the length of 500 feet, of one uniform thickness, sometimes by climbing to the tops of trees and falling down, climb up again; while others creep among the branches for several hundred feet. The hard, bony fruit of several species is used for making umbrella handles, toys, etc., under the name of Vegetable Ivory, Coquilla Nut, etc. The spathe of *Manicaria saccifera* comes off in the form of a conical cap, and is used as a covering for the head in the West Indies. The Doom Palm, of Egypt, has a trunk throwing out branches whose fruit is used as food, and has the taste of gingerbread.

But space will not allow of an enumeration of all the benefits of the Palm to the natives of the tropics. We find they furnish food in their fruit; sago, starch, sugar, wax, oil, milk, wine and brandy, from their trunks; cloth, rope and paper or parchment, from their fiber; building material, weapons, utensils and ink, from their wood; and the leaves furnish a covering for homes, clothing, baskets, fans for commerce, and a substitute for paper.

Contrary to our proposed rule, we shall not give the last of Palms in our collection, as it contains species of *Caryota*, *Chemœdoras*, *Mauritia*, etc., that are not suitable for lawn decoration, but will name a few of the best for such purposes. If any one should want a Palm not in our list, and we do not have it, we could furnish it without delay, as we are in direct dealing with dealers in Palms, etc.



Chemœrops Excelsa.

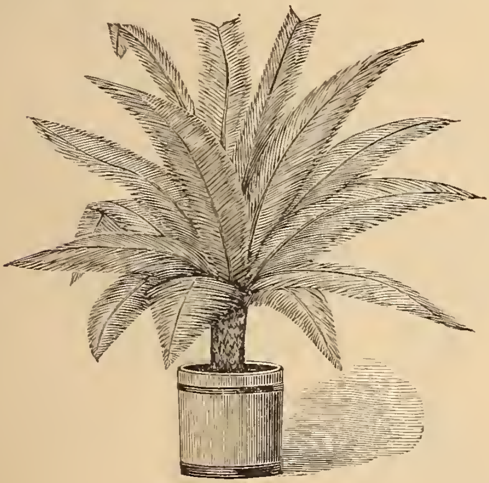


Chemœrops Humilis.

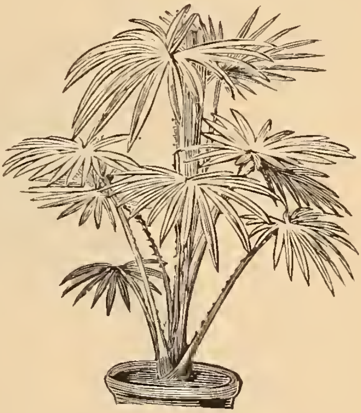
Order--PALMACEÆ.

BRAHEA FILIMENTOSA (*Pritchardia Filifera*).—A splendid novelty from Lower California, which, in sheltered situations, or where *Chemœrops excelsa* stands, would probably prove hardy. It is a Fan Palm, the novelty as well as the beauty of which consists in the thread-like filiments which hang from the edges of the leaves. These lengthen as the leaves grow, and droop together in confusion, rendering it very unique and distinct in character.

CARLUDOVICA PALMATA.—Handsome stemless Palms, with large, fan-shaped plaited leaves. The leaves are borne on three-cornered stalks from 6 to 15 feet high, often 4 feet in diameter and deeply cut into 4 or 5 divisions, each of which is again cut. This is the Palm that furnishes the material for the common Panama hat.



Cycas Revoluta.



Corypha Australis.

CHEMÆROPS EXCELSA, *or FORTUNI.*—A native of the north of China, and nearly hardy. Dwarf Palms in their native country, growing only 20 or 30 feet high, but with us attaining the height of only a few feet The leaves are shaped and plaited like the fan, having the margin deeply cut into numerous sharp pointed divisions; and the bases of their long and generally prickly footstalks are inserted into a mass of coarse fibrous matter. Color, dark green, erect. [See cut.]

CHEMÆROPS HUMILIS.—Very dwarf, not more than 3 or 4 feet high naturally, throwing out innumerable suckers from its creeping roots; leaves fan-shaped, of a glaucous green color, divided into narrow, erect segments. The hardiest and most useful of all the Palms. [See cut.]

COCOS UNCIFER.—The Cocoa-nut Palm thrives best in the shade, and the pot containing the plant should stand in water, as their natural locality is the rocky or sandy sea-shore of the East Indies. Their stems are inclined to curve or grow crooked, but can easily be kept straight and erect by proper treatment. Leaves are large and feathery, and in their native condition grow from 18 to 20 feet long.

CORYPHA AUSTRALIS—From Australia, where it grows to the height of 150 feet. The leaves are dark green, fan-shaped, nearly circular in outline but divided into small, narrow segments, or fingers; but each leaf is large and very strong, which enables them to withstand very strong winds without injury. Plants are fast growers and of easy culture, which makes them very desirable lawn or decorative plants. [See cut.]

CURCULIGO RECURVATA.—A handsome Palm-like plant, and often sold as a Palm; from the East Indies. Large, spreading, plaited leaves, gracefully recurved, giving the plant a very majestic appearance. A very useful decorative plant.

CYCAS REVOLUTA—The so-called Sago Palm, from China and Japan. Stout cylindrical trunks, and a showy crown of pinnate, dark green leaves from 2 to 6 feet long. The female plants bear in the center of the crown of leaves a tuft of woolly, pinnately-cleft leaves, in the notches of whose margins the naked or uncovered ovules or seeds are placed. The pith in the interior of the stem abounds in starch, which is highly esteemed in Japan. [See cut.]

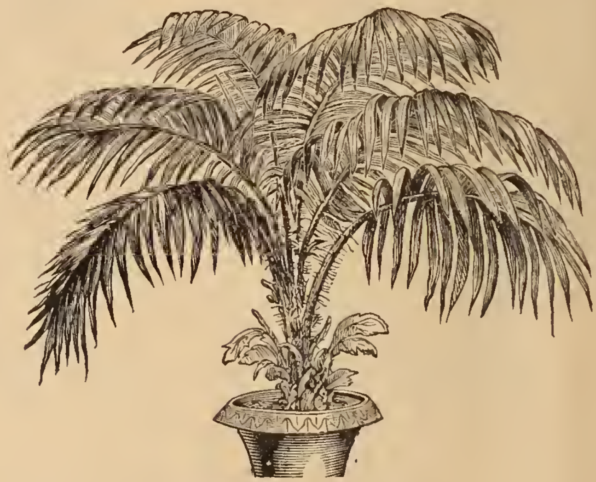
LATANIA BORBONICA—From the island of Borbon, South Pacific Ocean, has large fan-shaped leaves, with pendant marginal segments, of a bright green tint. Plant broad and spreading habit, and making one of the showiest ornaments on the lawn. [See cut.]

PHŒNIX CANARIENSIS—The Date Palm of the Canary Island and the adjoining African coast. Long, linear, gracefully recurved, pinnate, deep green leaves. Very decorative.

PHŒNIX DACTYLIFERA—The true Date Palm. A fast growing and very ornamental decorative plant, either for the house or lawn, and should be in every collection. Leaves long, feathery and gracefully recurving from the crown or summit of the plant.

SABAL ADANSONI.—The dwarf Palmetto of the Southern States. Stem short, leaves fan-shaped, circular, glaucous.

SABAL PALMETTO.—The Cabbage Palm of the Southern States, and the emblem of South Carolina. Erect, tall growing stem, surmounted by a crown of fan-shaped, plaited, deeply-cleft leaves; much cut at the edge, and with thread-like filaments hanging from between the segments. Hardy as far north as 34° 36′.



Seaforthia Elegans.

SEAFORTHIA ELEGANS, (*Ptchosperma Cunninghamii*).—One of the choicest decorative Palms, with a crown of feathery leaves upon its summit, often 10 feet long. [See cut.]

FICUS.

No one in the United States, to our knowledge, has made a very extensive collection of Rubber trees, and as they make such grand specimen plants, we publish a list of our species for the benefit of any one in search of any particular variety. This family of plants embrace the India Rubber tree, the Banyan tree (*Ficus Indica*) of India, the Figs, and several species of less notoriety, and are all natives of the warmer portions of earth. The ornamental varieties (Rubbers) require the sun and rich soil, with a plenty of water during summer, to do well as decorative plants in our climate; and during winter they must be kept warm and in a light situation, with very little water. The vine, or creeping varieties, must have heat and plenty of moisture to flourish, and when they do have the proper requirements they grow very fast and make fine plants in a short time; and as their leaves are small and thickly set on the vine, they are excellent for trimming. The fruiting varieties (true Figs) are deciduous, or ripen their leaves in fall, and can be kept in a cool cellar over winter, or they can be protected by winding with straw and left in the ground from year to year. Others lay them down and cover with straw and earth during winter, and think they fruit with such treatment the best. Although our collection is small, we have some very scarce ones.

L. B. CASE'S COLLECTION OF FIGS AND RUBBERS.

Order--MORACEÆ. *Tournfort.*

Ficus Australis.
" *Carica*, (*True Figs.*)
" *Elastica.*
" *Imperialis.*
Ficus Japonica.
" *Lanceolatus.*
" *Macrophylla.*
" *Macrocarpa.*
Ficus Nitida.
" *Repens.*
" *Sycamorus.*

HIBISCUS.

We add a list of the *Hibiscus* in our collection for the benefit of any who may desire choice lawn plants. The *Syriacus* varieties are from Asia Minor and are usually misnamed Althea, but the true Althea is a herbaceous plant, the Hollyhock, *Althea rosea*, the type of the family. They are usually hardy, and will make a fine display in the shrubbery during summer; however, a few hybrid varieties are not hardy enough to stand a very severe winter in the Northern States, and must be protected. The Chinese varieties (*Hibiscus sinensis*, and their hybrids,) are all tender, and must be kept from the frost, and if kept in a hot and moist atmosphere during winter will bloom quite freely. During summer they flower freely, and make splendid growth if planted in the open ground; but the soil must be rich and mellow. As specimen plants for the lawn, we think the old single red Chinese *Hibiscus* is by far the finest; but as double flowers are the most sought for, the double red varieties are the most saleable plants for the trade.

L. B. CASE'S COLLECTION OF HIBISCUS.

Order--MALVACEÆ.

TYPE—*Althea rosea, Cavanilles.*

Hibiscus Syriacus albus plena.
" " *bicolor.*
" " *coccinea.*
" " *marginatus.*
" " *purpurea.*
" " " *plenus.*
" " *ruber.*
" " *toto albus.*
" " *variegatus.*
Hibiscus sinensis carminatus perfectus.
" " *conspicua.*
" " *Cooperii tricolor.*
" " *cruentus.*
Hibiscus sinensis, double crimson.
" " " *orange.*
" " " *red.*
" " " *salmon.*
" " " *yellow.*
" " *fulgides.*
" " *grandiflora.*
" " *Kermesinus.*
" " *metallicus.*
" " *mineatus.*
" " *single rose.*
" " *single red.*
" " *vivicans.*

L. B. CASE'S
Retail Price List of Lawn Plants.

[Plants usually in 4 inch pots. Larger Plants at special rates.]

	Each.
Acacias, 6 varieties	50
Acalypha tricolor	30
Achæna Malvaviscus	25
Adhatoda cydoniæfolia	50
Agave Americana	25
" " variegata	50
" Sislandi	50
Alamanda cathartica	50
Alocasia odorata	2 00
Aloysia citriodora, (Lemon Verbena)	25
Arundo conspicua	50
Arundo donax variegata	75
Bambusa argentea	50
Banana, [See Musa.]	
Bohemeria argentea	50
Brahea filimentosa, (Palm)	2 00
Brugmansia Knighti	25
Calistemon lanceolatum	50
Canna, 6 choice varieties	25
Carludovica palmata, (Palm)	1 00
Caryota urens	1 00
Cassia formosa	50
Chemærops humilis, (Palm)	1 00
Citrus aurantica	1 00
" myrtifolia	2 00
" Otaheita	75
Clerodendron Bungeii	30
" fragrans	50
Cocolobia platyclade	25
Colocasia Bataviensis	30
Colocasia esculentum	35
Colocasia Javanicum	50
Crape Myrtle. [See Lagerstrœma.]	
Cupressus pyramidalis, (evergreen shrub)	50
Curculigo recurvata	50
Deeringia Amherstii aurea variegata.	25
Dracæna australis	50
" Braziliensis ... 50c. to	2 50
" congesta	35
" Draco (large plants)	10 00
" ferrea	50
" fragrans	50
" Haageana	75
" indivisa	50
" " marginata	75
" odorata	75
" terminalis	50
Erythrina Caffra	2 00
" Crista-Galli	75
" herbacea	1 00
" versicolor	1 00
Euonymus argenteus	25
" Japonicus	15
" " aurea var.	50
" " " marginata	30
" tricolor	50
Ficus australis	60
" carica, (true figs)	25
" elastica	75
" nitida	30
Hibiscus sinensis carminatus perfectus	50
" " conspicua	50
" " Cooperii tricolor	50

	Each.
Hibiscus sinensis cruentus	$ 50
" " double crimson	50
" " " orange	50
" " " red	50
" " " salmon	50
" " " yellow	50
" " fulgidus	50
" " grandiflora	50
" " single rose	75
" " " red	50
Hydrangea Hortensis	30
" paniculata	50
" radiata	25
" rose-alba	25
Japan Plum	25
Jasminum odoratissima	25
" revolutum	25
Lagerstrœma Indica	50
Laurus camphora	1 00
Ledenbergia rosea æneœa	30
Medinella erythrophylla	50
Musa Cavendishii	3 00
" paradisica	2 00
" rosacea	1 00
" sapientum	2 00
" zebrina	2 50
Myrtle, myrtus communis	50
Nerium. [See Oleander.]	
Olea fragrans	50
Oleander album	25
" flavum duplex	1 00
" Geant des Battles	75
" Madona grandiflora	1 00
" rosea	50
" splendens	30
" Such's New Double White.	1 00
Orange. [See Citrus.]	
Pandanus Javanicus variegatus	2 50
Panicum plicatum Vittata	50
Philodendron pertusum	1 50
" princeps	2 00
Phœnix dactylifera	50
Phormium tenax	50
Phrynum angustifolium	50
Pittosporum tobira Chinensis	50
" " variegata	75
Piper nigrum	50
Pomegranate, or Punica granatum alba plena	50
Punica granatum rubra plena	50
" " rubra	50
" " James Vick	50
Saccharum Maddeni	40
Sanseviera Guineensis	2 00
" Japanicum.	50
" Zeylanica.	1 50
Sanchezia nobilis variegata	50
" spectabilis variegata	30
Urtica macrophylla	50
Weigelia rosea	20
" " fol. var.	40
Yucca aloefolia	25
" pendula	50
" rosea	25

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In order to place our plants within reach of every one, especially those who do not live near an Express office we have prepared a list to be sent by mail postage paid. in lots of 5 or 10 plants upon receipt of $1.00. The list of 5 for $1.00 are choicer and rarer plants, but the 10 for $1.00 are all good varieties and worthy a place in any collection.

I will send to any part of the United States or Canada FREE of postage my selection of varieties, but all good kinds.

5 Varieties of Peperomas.	*For $1.00.*
5 Double Petunias.-extra fine	*For 1.00.*
5 Distinct varieties of Moss or Lycopodium.	*For 1.00.*
5 Beautiful Dracænas.	*For 1.00.*
5 Choice Echiveras.	*For 1.00.*
5 Amaryllis bulbs.	*For 1.00.*
5 Varieties of Stapelias.	*For 1.00.*
5 Choice variegated Ivies.	*For 1.00.*
5 Fancy Caladiums.	*For 1.00.*
5 Distinct Aloes.	*For 1.00.*

10 Ever-Blooming Roses	*For One Dollar*
10 Rex Begonias	*For One Dollar*
10 Flowering Begonias	*For One Dollar*
10 Choice Geraniums	*For One Dollar*
10 Beautiful Ferns	*For One Dollar*
10 Magnificent New Coleus	*For One Dollar*
10 New Lantanas	*For One Dollar*
10 Distinct Varieties of Cactus	*For One Dollar*
10 Euonymus (five varieties)	*For One Dollar*
10 Gladiolus,	*For One Dollar*
10 Varieties of Salvias	*For One Dollar*
10 Choice (different varieties) hardy vines	*For One Dollar*
10 Different varieties tender vines	*For $1.00.*
10 choice varieties Cannas,	*For 1.00.*
10 Plants in 5 varieties, Bouvardias	*For 1.00.*

Or the entire set, about 150 varieties, Express charges paid for $20.00.

Remember when ordering to give your name and post office address in full, and make all remittances by post office order, registered letter or New York draft. Send stamp for Illustrated Catalogue.

We propose to issue the INDEX Quarterly, and to all our customers it will be mailed free, but the subscription price to all others will be 50 cents a year, payable in advance.

Direct all letters and orders to

L. B. CASE, RICHMOND, INDIANA.

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AND
Tuberous - Rooted Plants for Fall Planting.
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L. B. CASE'S
BOTANICAL INDEX,

—TO THE—

NEW, RARE AND BEAUTIFUL PLANTS,

Grown and For Sale at his Commercial Greenhouses,
RICHMOND, IND.

Vol. 1. OCTOBER, 1877. No. 3.

TORREY BOTANICAL CLUB. NEW YORK

FALL PLANTING.

As the October number of the INDEX is being distributed to our patrons, the usually hot and dry months of July, August and the first half of September are passed and we enter upon our second, or Indian Summer, which is probably the loveliest portion of the whole year. It is then we find pleasure in out-door excursions through forest and field, gathering ripe fruit and nuts, or collecting in some secluded and sheltered localities choice plants or leaves to preserve as mementoes of a pleasant day. But the successful Floriculturist and Horticulturist will find little time now for recreation, for with the return of the cool and invigorating air of October and November they must be at work early and late, gathering crops and fruits, and making the final preparations for the approaching winter—planting the few hardy flower-roots and bulbs that thrive best with fall planting, nearly all of which bloom early in spring.

All the hardy bulbs and tubers should be in the ground early enough for the new roots to form before the ground becomes chilled and cold, as they will bloom in the spring just in proportion to the amount of food furnished the plant through the new roots from the soil; however, we would not recommend planting before the cool weather following the fall equinox—the American Indian Summer. Nearly all the early spring flowering bulbs are imported from Holland, and do not usually arrive in America before about the middle of September, so that there is very little time intervening between their arrival and the planting season; hence the necessity of knowing just what is wanted, and ordering early in order to secure good bulbs.

The seeds of many varieties of hardy Perennials, such as *Columbine*, *Feverfew*, *Snapdragons*, *Pinks*, hardy *Phloxes*, *&c.*, should be sown in beds and borders that have already been prepared, that they may germinate and the roots get started before winter sets in; for if they are planted as soon as they ripen, they will usually bloom the following summer, while if they are planted in the spring they do not bloom until the second year. They may be gathered and sown as soon as ripe, even as early as July, and should have a little mulching or protection, such as dry leaves or straw, thrown over the beds for fear the winter may be severe; it will also prevent the plants from being thrown out of the ground by repeated freezing and thawing during winter.

Ornamental Trees and Shrubs may now be reset, but it is a disputed question with Horticulturists whether fall or spring is the best season for planting some varieties of trees; but our observation has been that early fall planting has always succeeded well, when proper attention is paid to having the trees and shrubs set out before the roots become dry and shrivel up, and if the branches are cut back to correspond with the shortened roots. It is really never best to delay doing any work that can be done at any season, just because others may think there is a better time; especially work that can be done in the fall, as the springs are often late and so much needs attention, that many times work is done in such a hurry that it is only half done.

By the middle of November or first of December the frost will have killed all unripe wood of Roses, and the sooner it is removed the better for the plant; in fact, it is a decided benefit to cut back each year, to within a few inches of the ground, all rank and superfluous as well as unripe wood, and require the plant to start from near the ground each spring. This treatment will make the bloom a little later in the spring, but in place of a scanty show of flowers which the untrimmed plant would produce, there will be a profusion of large, fine, well formed flowers from the well pruned bushes. It also keeps the bushes in a neat symmetrical form, and quite ornamental even when not in flower; but as only the new growth produce flowers, and severe pruning causes the plant to constantly throw out new shoots, the result is a great profusion of flowers.

Amaryllis, Cannas, Caladiums, Tuberoses, Tigridias, and other tender bulbs, should be lifted before the frost touches them, as the chilling of the bulb or root is liable to injure it and prevent its sprouting again. After taking up the plants, lay them in the sun a few warm, sunny days before cutting off the stalks and leaves, so that a portion of the sap may return to the bulb, thereby hardening and ripening it, the better to prevent it from injury caused by evaporation during the following season of rest. They may then be stored in a cool, dry cellar during winter.

Dahlias, Erianthus, Gladiolus, Saccharum and *Tritomas*, and other half hardy roots, tubers and bulbs, may be allowed to remain in the ground until later in the season, to ripen before lifting; indeed, many varieties are so nearly hardy that by protection they would survive a mild winter in the ground, in our latitude, (40° N.), and further south they would require no protection. However, the trouble of digging up and planting in fresh, mellow soil, well enriched, would be well repaid in larger and more profuse flowers.

All Bulbs, Tubers and Flower Roots laid away for rest, either in winter or summer, should be packed in clear, dry sand, to prevent the evaporation of the moisture, or life of the bulb; but equal care should be taken to prevent them from becoming wet or even damp, which would surely be followed by rot and destruction.

DIFFICULTIES OF THE FLORIST.

THE Nurseryman and Florist have an experience in hard times entirely different from any other class of business men, for many reasons: First, their business is to a large extent a luxury that can be dispensed with without any inconvenience whatever, for in fact a very small portion of the masses of the people of our country ever invest anything in plants--or if they do, it is only a very small sum—while the number that care to afford the luxury of cut flowers is limited to a very few, except for particular occasions, and this is restricted almost exclusively to cities. Another reason is, that so many have been repeatedly swindled by traveling agents and irresponsible men, that swarm in such myriads over the country, soliciting orders for trees and plants they never owned, and filling their orders from the cheapest good-for-nothing stock they can find, which is usually represented to be from some of the numerous nurserymen who by their universally upright and fair dealing have won a reputation for their business. But the third and most important reason is summed up in the two words, DISHONEST DEALERS, which is the curse to all kinds of business. They present themselves to the public in a great variety of forms, and solicit their patronage universally with the philanthropic argument of such extortionate prices demanded by old and established houses for the same class of plants. One man will commence the year with a very small stock, and by misrepresentation and smooth talk secure from the trade a quantity of good things to help sell his cheaper stuff; but as he has established no business, he must sell again for just what he can get, regardless of what his plants first cost, for he never expects to pay, nor does he ever pay for them. Another man will fill an order for twenty different kinds of plants or trees from the same nursery row or beds of plants, each one bearing the desired label, but when they arrive at maturity all prove alike. But the plant business is just as legitimate and honorable as any in the country, and for those who love plants it is often a matter of choice as well as pleasure to raise and sell plants and flowers, and if there is any reason why this business is not profitable and sought after, it is because unscrupulous men have lowered the standard of the business.

Our experience during the past two years has taught us that there are a great many persons in the plant trade that cannot or will not make their word good, and while we have many friends in the business that we love to oblige, there are a few—yes, a good many—that will neither acknowledge the receipt of their bills, honor our drafts, or in any other manner meet their obligations, and to these we have a word to say that perhaps may be of interest. We take no pleasure in any one's misfortunes in his business, and have always avoided making requests upon our customers except in cases of need; but this leniency is entirely useless, and in the future we propose to adopt a different course. Our part of the transaction was faithfully completed when we delivered the order at the express office, and we do not propose to have any of our friends that are in the nursery business suffer by the same men that have defrauded us. We shall publish in the January number, 1878, of the INDEX, a list of all such as we have found to be dishonest—a black list, if you please—and mail to every dealer and agricultural paper we know of. This list will contain the names and residences of all who have bought from us and pay nothing; usually giving no reason for their refusal to do so. However, we have long since learned to discriminate between those who are trying to deal honestly with us, but from causes beyond their control cannot meet their obligations, and those who are perfectly indifferent to the just demands of their creditors. So none of our customers need fear any trouble in cases where an effort has been made to satisfy our claims.

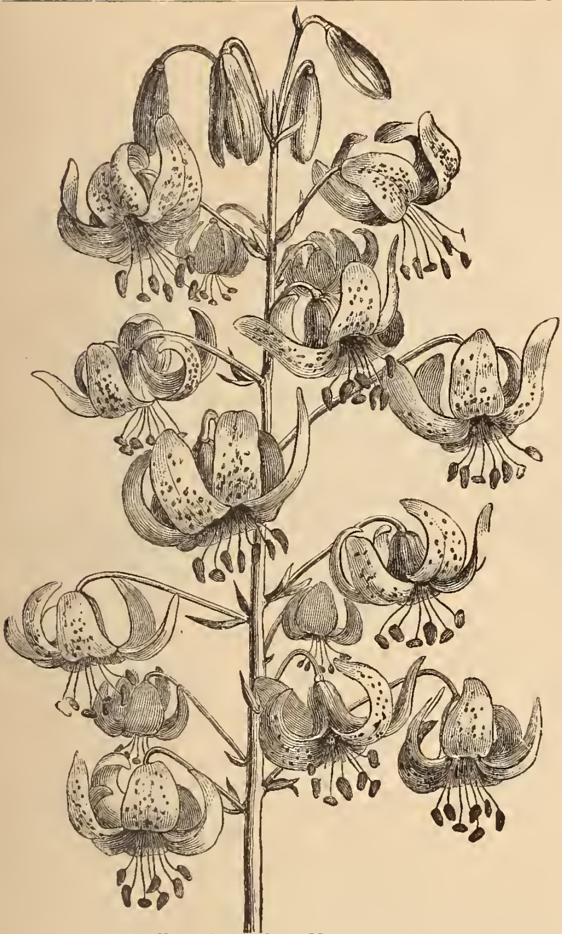

FIG. 10.—*Lilium Martagon.*

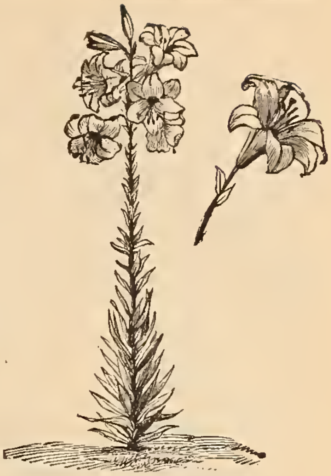

FIG. 8.—*Lilium Candidum.*

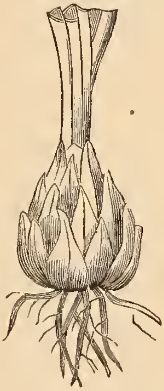

FIG. 9.—*Bulb of L. Candidum.*

LILIES.

ALL ancient writers, both in sacred and profane history, give the Lily a prominent place—some adopting the White Lily as the emblem of purity; for even the name Lily is said to be derived from the Celtic word "*li*," signifying whiteness, on account of the beautiful white flowers of *Lilium candidum* from the Levant, the best known and most universally distributed species of Europe. We usually associate the idea of extreme whiteness with the Lily, for certainly nothing can surpass in purity of color the white Lily; and on this account it was by the ancients held sacred to Juno. It has often been chosen by the titled nobility in different portions of the world, as well as by some nations, as their emblem, or coat-of-arms, to denote majesty as well as purity; and from this fact we may justly acknowledge them as the nobility of the vegetable kingdom. That old naturalist, Pliny, who lived in the infancy of science, said "the Lily is the next in nobility to the Rose," which he considers the prince. It must be borne in mind that Pliny lived and traveled in the land of Roses, and knew very little of the choicer varieties of Palms. Linnæus called the "Palms the princes, the Lilies the nobles, and the Grasses the plebians" of the vegetable kingdom.

The old white species, *Lilium candidum*, has been cultivated in Europe from time immemorial, and for a long period there were very few other species known; but upon the colonization of America the two choice old native species, *Lilium superbum* and *Philadelphicum*, were quickly introduced into European gardens, where they still hold a prominent place in collections of hardy plants. But the introduction of the Japan Lilies has given a new impetus to "Lily culture," for they are the gems of the tribe, and with the *L. auratum*, or Golden-banded Lily, and their hybrids, will constitute a new era and give new charms to a group of plants already so much admired.

Lilies are not very universally distributed over the world, for there is not a single known species in the southern hemisphere; and with the exception of the few found in the mountains of sub-tropical Asia, all the true species of the Lilies are from the temperate zone, while those from the mountains of southern Asia are found so high above the level of the sea that the natural temperature is about equal to the latitude of the temperate zone. In the great economy of nature the Lily has played no inconspicuous part, furnishing food to the inhabitants of many a desolate country. In Kamtschatka the roots of *L. pomponium* and *L. Kamtschatkensis* are cultivated for food, the same as potatoes are in the United States. The bulbs of *L. martagon* are used by the Cossacks, and those of *L. tigrinum* in China and Japan, for food. Some medical properties have been ascribed to various species by ancient writers, but modern practitioners found no virtue in them until within the past few years, when they have been employed by the homeopathists with marked success.

The Lilies are all annual herbs with sealy bulbs that remain in the ground dormant during winter, and do not do well to disturb oftener than about every three years. They should never be taken up in the spring, as they commence to grow early, and if they do not have a plenty of roots the vitality of the small bulb is exhausted in the effort to nourish a tall, rank growth of stalk, and still more in furnishing nutriment for the flower. We have prepared a cut of the typical forms of Lily Bulbs, that those interested in the study of plants may see the difference in them. Fig. 16 represents the American species, *L. superbum*, &c., with a solid bulb or root covered with small white scales. Fig. 14 the Oriental species, of which *L. lancifolium* is the type, with small, upright, leafy scales, forming a complete crown. While in the Occidental species, Fig. 9, with *L. candidum* for a type, we have large leaf-like scales, terminating in a ground leaf, or bunch of leaves growing above the ground. Nearly all the species produce flowers very similar in form, except the *L. Philadelphicum*, Fig. 17, which is erect, and nearly all are more or less fragrant, especially the Japan species. Nearly all the species are perfectly hardy, especially the Japan varieties, and will grow very well in any ordinary garden soil, except the *L. superbum* and *Philadelphicum*, which should be grown in peat. But to produce fine specimens five feet high, with twenty or more flowers on a single stem, requires a better prepared and more favorable compost. This may be readily done by removing a portion of the old soil, and replacing the same with peat or leaf mould and sand; mixing the whole well together to the depth of eighteen or twenty inches. In such soil they will thrive with vigor, and produce an abundance of flowers.

The best time for planting *L. candidum* is in July or August, before the ground leaves commence to grow, for they grow early, and like all other plants do not like to be disturbed while growing. All the other Lilies may be planted in October, or even November, and should be set about five inches deep and twelve inches apart. Before winter sets in, cover the bed to the depth of three or four inches with leaves, strawy manure, or tan. In April remove the covering, stir the surface of the bed, keep it clear of weeds, and in July they will make a magnificent display of flowers. When required to be removed, take them up and plant again as soon as possible. A layer of six inches of well-rotted cow manure, placed five or six inches below the bulbs, is the best fertilizer we have tried for Lilies. Although not a spring flower, it is nevertheless a most valuable acquisition to the summer garden, as the blooming of the different varieties are prolonged during the entire season; the flowers appearing in early spring on some of the species, followed by other varieties until frost. They will continue to bloom much longer if shaded from the noonday sun.

The *L. lancifolium* varieties are among the most beautiful and delightfully fragrant, imparting a vanilla perfume. The flowers, internally, are covered with a beautiful frost-like surface, standing out like crystals, and richly marked and tinted with rose and crimson spots; excelling in beauty any description that can be given. They bloom in July, August and September; and their hardiness, easy culture and elegance commend them to all admirers of beautiful flowers. All the varieties of the Japan Lilies are perfectly adapted to culture in pots. For this purpose, pot them in a mixture of light turfy loam and leaf mould.

The *L. auratum*, or Golden-rayed Lily, is also from Japan. This is a most superb Lily, and has been called the King of Lilies. The flower is from eight to twelve inches across, composed of six delicate, ivory-white ground petals, each being thickly studded with rich chocolate-crimson spots, and having a bright golden band through the center of each petal, with an exquisite vanilla-like perfume. Strong, well established bulbs will produce a dozen or more of these magnificent flowers. It is perfectly hardy in the open ground, and also grows and blooms finely in pots. It will not bear manure, and should be planted in not too rich soi .

The Candidum Lily makes a leaf growth in autumn. If the bloom is wanted the following year, all removal or setting of the roots must be done before this growth commences, or the bloom will be likely to fail. If taken up and potted during October, they will bloom in a south sunny window during winter.

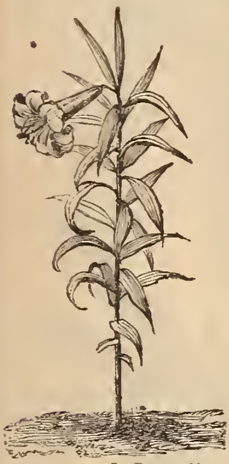

FIG. 11.—*L. Brownii.*

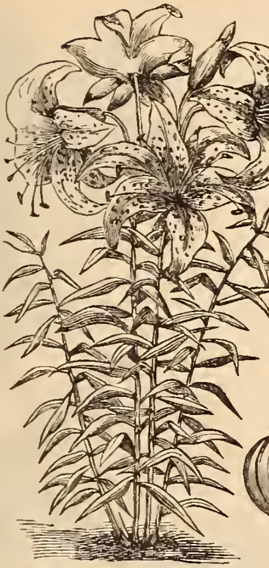

FIG. 12.
Lilium Auratum.

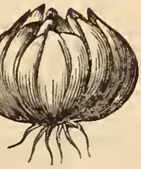

FIG. 14.
Bulb of L. Lancifolium.

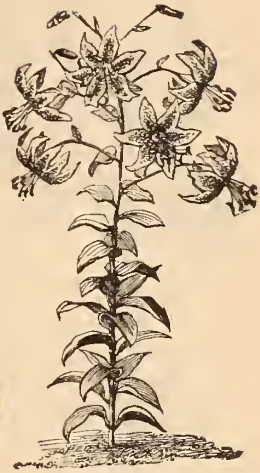

FIG. 13.—*L. Lancifolium.*

L. B. CASE'S COLLECTION OF LILIES.

Order--Liliaceæ. *Tournefort.*

TYPE—*Lilium Candidum.* *Linnæus.*

JAPAN LILIES.

	Each.	Per doz.
Lilium Auratum, Golden-banded Lily	50c.	$6.00
“ *Fortunei*, scarlet, spotted black	50c.	
“ *Lancifolium album*, pure white	50c.	6.00
“ “ *Roseum*, rose spotted	30c.	2.50
“ “ *Rubrum*, crimson spots	30c.	2.50
“ “ *punctatum*, white, spotted with delicate salmon	60c.	...
“ *Longiflorum*, large and beautiful, snow-white, trumpet-shaped flowers, fragrant, hardy species from twelve to eighteen inches in height	25c.	2.00
Lilium Takesima, a new Japanese variety, introduced by Dr. Von Siebold, grows about two feet high, fine foliage, large white flowers, similar in form to *L. longiflorum*, but larger; a splendid acquisition	.75c.	8.00

OTHER LILIES.

	Each.	Per doz.
Lilium Candidum, flower white, fragrant	25c.	$2.50
“ *Chalcedonicum*, brilliant scarlet, elegant, fine	75c.	7.00
“ *Excelsum*, creamy, very beautiful	50c.	
“ *Fulgens aurantiacum*, orange	25c.	2.00
“ “ *Atrosanguineum*, blood red, shaded with orange, fine	35c.	3.50
“ “ *Umbellatum erectum*, orange red, large flowers, fine upright growth	35c.	3.50
“ “ “ *grandiflorum*, deep orange red, with large heads of flowers	35c.	3.50
“ “ *Incomparable*, dark blood red orange, blooms freely in very large showy heads of flowers, extra fine	35c.	3.50
“ *Giganteum*, the tallest of the Lilies, growing six to eight feet high, with white, trumpet-shaped flowers, streaked with carmine, not hardy here, but suited to greenhouse culture	$5.00	
“ *Grooms' Hybrid*, blood red, spotted black	50c.	5.00
“ *Humboldti*, yellow, with dark spots	75c.	7.00
“ *Kamtschatkensis*, orange, eighteen inches	50c.	4.50
“ *Martagon*, (Turk's Cap,) various colors, three feet	.35c.	3.50
“ *Tigrinum*, old Tiger Lily, orange-salmon, spotted black	25c.	2.00
“ *Tenufolium*, scarlet	$1.00	....

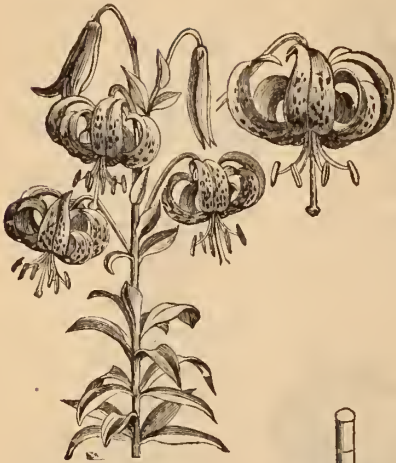

FIG. 15.—*L. Superbum.*

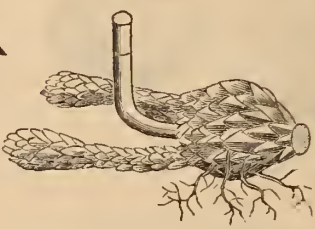

FIG. 16.—*Bulb of L. Superbum.*

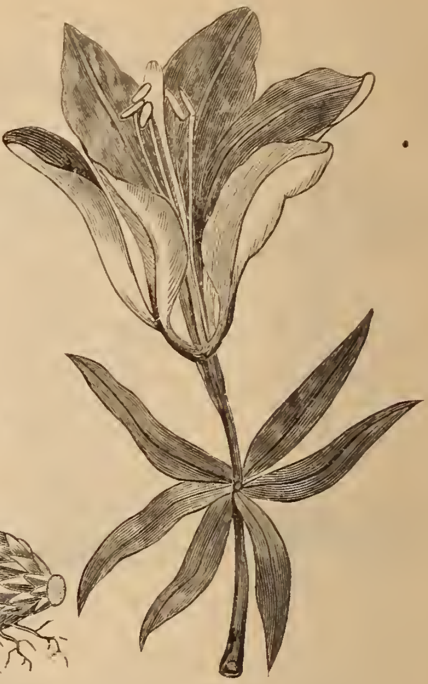

FIG. 17.—*Lilium Philadelphicum.*

AMERICAN LILIES.

It is an old maxim that native talent or native products are not appreciated or desired at home, but must seek a foreign market; and to such an extent is this rule applied to native American plants, that we are often compelled to order our entire stock of certain things from Europe, whose enterprizing dealers are constantly employing collectors in America, as well as in other portions of the world, to supply the constant demand for foreign plants. Because *L. superbum* and *L. Philadelphicum* are growing wild in our fields, they are considered by many too common to plant in the flower garden; but they are really among the choicest plants grown, and hold a very prominent place in the gardens of Europe. Very few flowers have the rich scarlet lustre of the *L. Philadelphicum*, and in addition to their beautiful flowers, they are so different from all other varieties that they command immediate attention while in bloom. The flowers stand erect on this one species, and although they usually produce only two flowers naturally, by cultivation they are improved so much that it is no uncommon sight to see whole beds producing four brighter and larger flowers upon each stalk.

	Each.	Per doz.
Lilium Philadelphicum, a very beautiful plant, producing from one to four bright red flowers, spotted with black; very desirable	35c.	$3.00
Lilium Superbum, one of our own native species, rarely met in our gardens but very popular in Europe. Beautiful and rich as many of our native Lilies are, this far exceeds them all, bearing, as it does, a pyramid of yellowish red flowers, from twenty to fifty in number, in full bloom in the early part of July. In good soil it will frequently reach the height of eight feet..	20c.	1.50

DOUBLE FLOWERING LILIES.

Lilium Tigrinum flore pleno, Double Flowering Tiger Lily. This extraordinary variety was first introduced into this country a short time since by Thomas Hogg, Esq., during his late residence in Japan, and is very rare in this country, and has not, as far as we are aware, been introduced into European gardens. It is very double, frequently having thirty petals to each flower, of the same color and spotting as the single species, and is most beautiful and remarkable.	75c.	
Lilium Candidum flore pleno, a double flowering variety of the grand old *L. candidum*	35c.	3.50
Hemerocallis Germanica flore pleno, a double flowering variety of the common old garden Day Lily.	25c.	2.00

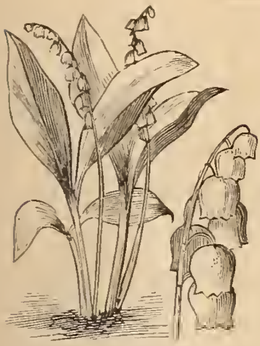

FIG. 18.—*Lily of the Valley.*

SO-CALLED LILIES.

LILY OF THE VALLEY.

One of the most beautiful spring-flowering plants, whose delicious odor is universally sought, being proverbial for its neat and chaste outline of growth, which is close, dwarf and compact.

	Each.	Pr. doz.	Pr. 100
Convallaria majalis, white, fine large clumps	50c.	$5.00	
" " strong pips for forcing		75	$5.00

DAY LILIES,

	Each.	Per doz.
Funkia Japonica alba, flower white, fragrant	50c.	$5.00
" **cerulia**, flower blue	25c.	2.00
Hemeracallis flava, Lemon-scented Lily	25c.	1.50
" **fulva**, old garden variety	15c.	1.00
" **Germanica**	20c.	2.00

DUTCH FLOWERING BULBS.

UNDER the general name of DUTCH FLOWERING BULBS, the dealer each fall offers a list of Hardy Bulbs that are among the most valuable acquisitions to the flower garden; in fact, no class of plants has been brought to a greater degree of perfection than the HYACINTH and TULIP, through the skill of the gardeners of Holland, for it is in Holland especially that we find the finest varieties. They are natives of nearly every portion of the known world, but the larger number of varieties are from Southern Europe and the Levant, where they are often found in great abundance. In their native condition they are very unpretentious and inferior to what we now see them under cultivation, for no soil or climate has yet been found so well adapted to their wants as the reclaimed beds of the Haarlam Sea, in Holland, and no gardeners have had as good success in producing such rich colors, as well as such large, fine bulbs, as the native Hollanders. This superiority of the Holland grown bulbs is recognized all over the civilized world, and each year Holland supplies nearly the entire demand for fresh bulbs, which are so much more worthy of cultivation than our native grown bulbs, that the sale of those grown in America find little favor with the purchaser. All plant growers have noticed how each year the flowers of their once choice bulbs deteriorate, and if they were to examine the bulbs they would soon find that the direct cause was the depauperation of the bulb which gives life and beauty to the flower.

Each year we receive all the older varieties at about the same price, and although when we publish this list the stock is not yet in America, we feel justified in advertising them at the same old price for unnamed varieties. But if any one should wish the more distinct or named varieties, we can furnish them at special rates.

UNNAMED AND MIXED HYACINTHS.

The following HYACINTHS are in separate colors, but without names; and also in mixtures of various colors and shades. They are especially adapted for out-door culture, in beds, groups, in flower borders, &c., producing beautiful displays of flowers at small cost. They are large, sound bulbs, and bloom freely and with very fine spikes or flowers.

	Each.	Per doz.
Double Red	$0.15	$1.50
" **White**	.15	1.50
" **Blue**	.15	1.50
" **Yellow**	.25	2.00
" **Mixed Colors**	.15	1.50

	Each.	Per doz.
Single Red	$0.15	$1.50
" **White**	.15	1.50
" **Blue**	.15	1.50
" **Yellow**	.20	1.50
" **Mixed Colors**	.15	1.50

EARLY ROMAN HYACINTHS,

So extensively used by Florists for forcing. They flower two to three weeks in advance of the Holland Hyacinths. **15 cents each. $1.50 per dozen.**

HYACINTHUS.

These are very pretty spring-flowering plants, well adapted for pot or border culture, and succeed well in ordinary garden soil.

	Each.	Per doz.
Belgicus albus, white	10c.	$1.00
" **cœruleus**, blue	10c.	1.00
" **rubra**, red	10c.	1.00
" **roseus**, rose	10c.	1.00
Botryoides alba, (Grape Hyacinth) white	25c.	2.50
Botryoides cœrulea, blue	10c.	1.00
Racemosa, light blue, fine	25c.	

	Each.	Per doz.
Monstrosus, blue	10c.	$1.00
Muscatus major, (Musk Hyacinth), blue and yellow	25c.	2.00
Muscatus minor, a smaller variety of the preceding	10c.	1.00
Plumosa, (Feathered Hyac'th) purplish blue	10c.	1.00

SCILLAS.

These are an exceedingly beautiful class of early flowering bulbs, blooming in spikes of graceful, bell-shaped flowers of various colors.

S. Sibirica is a perfect gem, with flowers of the richest metallic blue, quite dwarf, and blooms with the crocus; the others in succession till June. They appear most beautiful when planted in groups. All the kinds enumerated below are quite hardy, and require no particular care. They are also suitable for house-culture in pots.

	Each.	Per doz.
Scilla praecox, dark blue	10c.	$1.00
“ **Sibirica**, brilliant metallic blue	10c.	1.00
Scilla campanulata, dark blue	10c.	$1.00
“ **amœna**, fine blue	10c.	1.00

TULIPS.

For ages the Tulips have been a universal favorite; their brightness and variety of color, together with their perfect hardiness, has secured them a high position in the floral world. We know of no other flower bulb that will give, with little or no care, such universal satisfaction. Like other flower bulbs, they thrive best in sandy loam; however, they produce flowers in any common garden soil. *Plant from Sept. 15th to Dec. 1st.*

	Each.	Per doz,
Tulips, early, single white	20c.	$2.00
“ all colors mixed	5c.	50
“ double white	15c.	1.50
“ “ yellow	10c.	75
“ “ mixed	5c.	50
“ **Duc Van Thol**	10c.	75
“ **Parrot** or **Dragon** varieties, mixed	10c.	75
Tulips, byblœmen, mixed, (white ground, flaked and marbled rose and violet)	10c.	75
Tulips, bizarres, fine mixed, (yellow ground, flaked and marbled crimson, black, &c.)	10c.	75

PARROT, MONSTROUS OR TURKISH TULIPS.

These are large, brilliant and very showy, and admired on account of their singular appearance. Not recommended for pot culture.

Admiral of Constantinople, dark red	10c. each.	$1.00 per doz.
Gloriosa, yellow, bright scarlet	10c. “	1.00 “
Lutea major, large yellow	10c. “	1.00 “
Perfecta, striped	10c. “	1.00 “

POLYANTHUS NARCISSUS.

An elegant flower for winter and spring decoration, either for the house or garden, the cultivation being the same as for the Hyacinth, except that the crown of the plant should be at least five inches under the surface, and for winter protection should be covered with three or four inches of litter. For in-door cultivation, the bulbs being large, a somewhat larger pot should be used than is required for Hyacinths.

	Each.
Gloriosa, white, with orange cup	20c.
Grand Monarque, white, with pale yellow cup	20c.
Staten General, lemon color	20c.
Mixed, all colors	15c.

DOUBLE NARCISSUS.

Exceedingly showy, sweet scented, spring-flowering bulbs, which are especially valuable on account of their ease of culture, early flowering and generally effective appearance. They thrive in any soil and are very attractive.

	Each.	Per doz.
White Sweet Scented	8c.	75c.
L'Incomparable	6c.	50c.
Orange Phœnix	6c.	50c.
Silver Phœnix	6c.	50c.

DAFFODIL.

Von Sion, double yellow.... 10c. each. $1.00 per doz.

JONQUILS.

Pretty yellow flowers, varieties of the Narcissus, having a most agreeable fragrance. They are cultivated in pots, or the open ground; the buds being small, four or five may be planted in a five-inch pot, if for pot culture.

	Each.	Per doz.
Single, sweet scented	5c.	50c.
Double, sweet scented	20c.	$2.00

STAR OF BETHLEHEM. (*Ornithogalum Umbellatum.*)

Flowers star-shaped, pure white, very hardy. 10c. each. $1.00 per doz.

Plant from September 1st to December 1st.

DUTCH CROCUS.

Plant in the open ground, in October, November and December, preferring deep, light, rich, sandy soil; but the Crocus will thrive in any ordinary soil or situation. In planting, the bulbs should be covered from two to three inches with fine mould, and not more than two inches apart. For edging borders and beds, the Crocus is also exceedingly useful; and where planted in lines along the margin of walks, or in clumps of three, six, twelve, or more, bulbs each, and allowed to remain in the ground for several years, the effect of the immense masses of flowers which they produce is all that can be desired.

	Per doz.	Per 100		Per doz.	Per 100
Blue sorts, mixed	20c.	$1.25	**Cloth of Gold**	25c.	$1.50
White " "	20c.	1.25	**Cloth of Silver**	25c.	1.50
Striped " "	20c.	1.25	**Versicolor**, mixed sorts	25c.	1.50
Golden Yellow	20c.	1.25	**Mixed Colors**	20c.	1.25

THE SNOWDROP.

This, the earliest of spring-flowering bulbs, is universally admired for its elegant snow white drooping blossoms. They succeed well in any soil, and should be planted where they are to remain, as they bloom best if not disturbed.

	Each.	Per doz.	Per 100
Single Snowdrop, (*galanthus navalis*)	3c.	25c.	$1.75
Double " (*galanthus novalis, fl. pl.*)	5c.	50c.	3.50

SNOWFLAKES.

The flowers of the Snowflake (*Leucojum*) have some resemblance to the common Snowdrops, but are much larger, growing to the height of one foot; flowers white, and pendant from the top of the flower-stems. Each petal tipped with a green spot. *L. vernum* flowers early in spring, and is a little tender, requiring to be covered in winter. *L. æstivum*, the summer Snowflake, blooms later, and is perfectly hardy. Both are very graceful and pretty flowers.

Leucojum varnum, Spring Snowflake	25c. each.
" **æstivum**, Summer Snowflake	15c. "

ARUM DRACUNCULUS.

A very curious plant, the stalks of the leaves being spotted with brown and purple like the body of a snake. They are entirely hardy.

Arum Dracunculus, ... 25c. each. $2.50 per doz.

HARDY GLADIOLUS.

The Gladiolus, now so deservedly placed at the head of the summer-flowering bulbs, needs no further praise. The hardy sorts, blooming in the spring, cannot certainly claim so high a regard, but they are highly desirable and beautiful additions to the garden. They are so easily cultivated, so hardy, and bloom for so long a period, and at the same time are so decorative in their habit, that they should find a place in the garden of every amateur. They require the same culture as the Hyacinth.

	Each.	Per doz.		Each.	Per doz.
Byzantinus, crimson purple	10c.	$1.00	**Communis flora rosea**, rose	10c.	1.00
Communis flora alba, white	10c.	1.00	**Colvillii**, crimson & white, fine	10c.	1.00
" " **rubra**, red	10c.	1.00	Finest mixed	10c.	1.00

CROWN IMPERIALS.

One of the old-fashioned, very stately, early spring-blooming flowers, that should be in every garden. Its crown of bell-shaped flowers, surmounted with a tuft of green leaves, gives it a peculiar appearance. Planted at intervals of two feet in a bed of Tulips or Hyacinths, it prevents possible monotony. Those with variegated foliage have a very pretty appearance in the border. Plant early, five or six inches deep, allowing them to remain for years without disturbing. They grow and bloom in common garden soil. Flower stalks two feet.

	Each.		Each.
Aurora, single red	$0.35	**Folium Argenteum**, silver-striped foliage	$1.25
Couronne, orange	75	**Maximum**, bright red, single	50
Flore Pleno, double yellow	1.25	" single yellow	75
Rubra Pleno, double red	1.00	Varieties, mixed, 30c. each; per 10, $2.50.	
Folium Aureum, gold-striped fol	60		

FRITILLARIAS.

Miniature Crown Imperials, with singularly marbled flowers, succeed in any common garden soil.

Fritillarias, fine mixed	10c. each.	$1.25 per doz.
" **Persica**	15c. "	1.50 "

BULBOUS IRIS.

This is a well-known popular genus, differing in style of flower from any of the preceding; they are perfectly hardy, and both beautiful and showy. They should be planted in clumps of three or more, in a situation where they can remain undisturbed for several seasons. They are well adapted for pot culture. Should be planted as early in the season as the bulbs can be obtained, as they do not keep well out of ground.

	Per doz.		Per doz.
English Iris, finest mixed	$1.00	**Susiana**, blush, tinted and netted with dark lines	$3.00
Spanish Iris, finest mixed	75	**German**, or **Fleur-de-Luce**, splendid collection—50 varieties	3.00
Pavonia, white, blotched with blue	1.00		
Persica, white, blue and purple	1.00		

MOUND BUILDERS' FOOD.

DURING the summer of 1876, the G. R. & I. R. R. opened a gravel bank on JOSEPH RATLIFF'S farm, one and one-half miles north-west of Richmond, Indiana, and in the course of their excavations the workmen opened what was evidently an old burying ground of undoubted Mound Builders' origin. The bones crumbled to atoms upon exposure, but with them was found a crushed jar made of the peculiar composition known to archæologists as "Indian pottery," of the oldest American type, and with it a quantity of something that by competent judges has been pronounced *charred Indian corn.* This is the first time Indian corn has been found in as old a grave in America, at least to our knowledge, but Prof. M. C. REED, of Hudson, O., informs me that in an old Indian jar from Missouri, he found what he pronounces without hesitation to be grapes.

L. B. CASE'S

PRICE-LIST OF PLANTS.

HARDY HERBACEOUS PLANTS.

	Each.	Per doz.
Achilea rubra and Tomentosa	$0.15	$1.50
Aquilegia Vulgaris, double and single, white varies to purple	10	1.00
Asclepias Tuberosa	10	1.00
Astilbe Japonica	20	2.00
" " **variegata**	30	3.00
Dielytra (Dicentra) Spectabilis, Bleeding Heart	20	1.50
Eryngium Yuccafolium	10	1.00
Erianthus Ravenna, Pampas Grass	40	3.00
Funkia Japonica cerulea, Blue Day Lily	25	2.00
" " **alba grandiflora**	40	3.00
Gynerium Argenteum, Pampas Grass	40	3.00
Hemeracallis Flava, Fulva and Germanica	15	1.50
" **flora plena**	25	2.00
Iris—Bertha	25	2.00
" **Star of India**	25	2.00
" **Prunilla**	10	1.00
" **Pseudo Acorus**	25	2.00
Pardanthus Sinensis, Blackberry Lily	10	1.00
Phalaris Arundinacea Picta, Ribbon Grass	15	1.00
Pœnia Fragrans, rose color	25	2.00
" **Humilis**, Spanish Dwarf, bright rose	35	3.50
" **Whitleji**, white, fragrant	25	2.00
Saccharum Maddeni, a new Pampas Grass	40	3.00
Sedum Carnea variegatum	25	2.00
" **Glaucum**	25	2.00
" **Hypnoides**	15	1.50
" **Japonicum**	25	2.00
" **Sieboldi**	25	2.00
" **Japonicum folias aurea variegata**	25	2.00
" **Monstrosum**	15	1.50
" **Sieboldi variegatum**	25	2.00
" **Telephium**, Live-forever	15	1.50
" **Ternatum**	15	1.50
" **Acra**	15	1.50
Silphium Laciniatum, Compass Plant	15	1.50
Staticea Lanata	15	1.50
Yucca Filamentosa	25	2.00

HARDY VINES, CLIMBERS AND CREEPERS.

Acacia Rose or Moss Locust—Robina hispida	$0.20	$1.50
Althea—Hibiscus Syriacus, double and single	25	2.00
Almond, double red flowering	15	1.50
" " white "	25	2.00
Aralia Spinosa, Hercules' Club	25	2.50
Barberry Canadensis and Vulgaris	50	4.00

Benzoin Odoriferum, Spice Wood, (Laurus Benzoin)	$0.15	$1.50
Box—Buxus Sempervirens	15	1.25
Box Elder, Ash-leaved Maple, (Negunda Aceroides)	25	2.00
Currant, Missouri yellow-flowering	15	1.50
Cydonia Japonica, "Japonica," (Cydonia Japonica)	50	4.00
Deutzea Cretica plena flora, Gracilis, Fortuni	25	2.00
Euonymous Americanus and Autropurpurea	20	1.75
Forsythea Virdidissima, Golden Bell	25	2.00
Hydrangia Radiata	25	2.00
Kentucky Coffee Tree, Gymnocladus Canadensis	25	2.00
Lilac, common white, purple and Persian	15	1.50
" Charles X., Josekia and Floribunda	40	4.00
Lonicera Tartarica rubra, Bush Honeysuckle	25	2.00
Mahonia Aquifolia	50	4.00
Mountain Ash, Pyrus Americana, 6 to 8 feet	35	2.50
Mock Orange, Philadelphus Coronarius	10	1.00
" " " Grandiflorus	10	1.00
Plumbago Larpenta, 6 to 12 inches, hardy	25	2.00
Privet, Ligistrum Vulgaris	10	1.00
" Golden variety	20	2.00
Red Bud, Cercis Canadensis	15	1.50
Service Berry, Amelancher Canadensis	15	1.50
Silver Maple, Acer dasycarpum	25	2.00
Smoke or Mist Tree, Rhus Cotinus, purple	50	4.00
" " " Chionanthus Virginica, white	50	.....
Snow Ball, Vibernum Sterillis	25	2.00
Snow Berry, Symphoricarpus Vulgaris, Purple Fruit	30	1.75
" " " Occidentallis, white Fruit	20	1.75
Spice Wood, Benzoin Odoriferum	15	1.50
Spiræa Billardi, Callosa (**Fortuni**), **Hypericifolia, Prunifolia, Reevesiana** (**Lanceolata**), **Salicifolia, Sorbifolia, Thunbergii and Tomentosa**	25	2.00
St. John's Wort, Hypericun Prolificum	10	1.00
Tree Cranberry, Viburnum Opulus	25	2.00
Weeping Willow, Salix Babylonica	15	1.00
Wigelia Rosea	25	2.00
Wigelia Nana variegata	50	......

HARDY VINES, CLIMBERS AND CREEPERS.

Adlumia cirrhosa, Alleghany Vine	$0.15	$1.00
Akebia Quinata	25	2.00
Bignonia Radicans	25	1.50
Jasminum Nudiflorum and Officinale	20	2.00
Lathyrus Latifolius, hardy Sweet Pea	10	......
Lonicera Halliana, Aurea Reticulata and Sempervirens	25	2.00
Periploca Græca, Virginia Silk Vine	25	2.00
Smilax Rotundifolia, native	25	2.00
Wisteria Fruticens, 2 to 4 feet	15	1.00

TENDER BULBS, FOR WINTER FLOWERING.

Amaryllis Regina { Large Plants	$1.00	$9.00
{ Small Plants	25	2.00
" **Lutea**	15	1.50
Calla Ethiopica, in 6 inch pots	40	4.00
" " in 3 inch pots	20	2.00
Canna Rubra Superbissium	25	2.00
Cyclamen Persicum	25	2.00
Eucodonia Nægliodes	50	5.00
Eucharis Amazonica, (Amazon Lily)	75	6.00
Gesnaria Geroldiana	25	2.00
" **Refulgens and Zebrina**	50	5.00
Oxalis Alba, Bowieii, Capensis and Deppii	20	1.75
Smilax, Myrsiphyllum Asparagoides	50	4.00

WINTER FLOWERING PLANTS.

Abutilon Boule de Niege	$0.25	$2.00
" **Vexillarium Pictum**	35	3.00
Bouvardia Elegans	25	2.00

Bouvardia Hogarth	$0.25	$2.00
" Leiantha	25	2.00
" Vreelandii	40	3.00
Carnation La Purite	25	2.00
" Mineata	25	2.00
" President DeGraw	25	2.00
" Rosea Fimbriata	25	2.00
" Vaillante	25	2.00
Cestrum Auranticum	25	2.00
" Laurifolium	25	2.00
" Parqui, Night Blooming Cestrum	25	2.00
Centradena Grandiflora	50	4.00
" Rosea	50	4.00
Cuphea Platycentra	15	1.50
" Danilisima	15	1.50
" Eminens	20	1.75
" Hyssopifolia	25	2.00
Euphorbia Jacquiniflora	50	4.00
" Splendens	50	4.00
" Spinosa	50	4.00
Eupatorium Arboreum	25	2.00
" Elegans	25	2.00
" Angustifolium	25	2.00
Fuchsia Coccinea Rosea	25	2.00
" Corymbifolia	25	2.00
" Fulgens	25	2.00
" Macrophylla	25	2.00
" Mrs. Marshall	25	2.00
" Speciosa	25	2.00
" Syringifolia	25	2.00
Goldfussia Anisophylla	25	2.00
Habrothamnus Elegans	25	2.00
" Magnifica	25	2.00
Jasminum Grandiflorum	25	2.00
" Odoratissimum	25	2.00
" Revolutum	35	3.00
Justicia Alba	25	2.00
" Carnea	25	2.00
" Discolor	25	2.00
" Purpurea	25	2.00
Laurus Tinus	40	3.50
Libonia Floribunda	25	2.00
" Penrhosiensis	30	3.00
Linum Tryginum	25	2.00
Lopezia Rosea	25	2.00
" Mineata	25	2.00
Olea Fragrans, Fragrant Olive	50	4.00
Pittosporum Tobira Chinensis	50	4.00
" " Variegatum	50	4.00
Plumbago Capensis	40	3.00
" Larpentæ	25	2.00
" Rosea	35	3.00
" Zeylanica	25	2.00
Primula or Primrose, Single and Double	35	3.00
Rhyncospermum Jasminoides Variegata	1.00	9.00
Rivinia Braziliensis	25	2.00
Stevia Compacta	25	2.00
" Rosea	25	2.00
" Serratifolius	25	2.00
Violets—Czar, Schœnbrun, Laucheana Russian, Semperflorens	25	2.00
Veronicas—Andersoni, Glory de Loraine, Magna Rosea	15	1.80

RECENT PUBLICATIONS.

American Agriculturist, New York City, September, 1877.
American Naturalist, Boston, Mass., Sept., 1877.
Botanical Gazette, Hanover, Ind., Sept., 1877.
Bulletin of the Torry Botanical Club, New York City, Sept., 1877.
Cactus, and other Tropical Succulents, H. ALLNUTT. London, England. 1877.
Gardener's Monthly, Philadelphia, Pa., Sept., 1877.
Ladies' Floral Cabinet, New York City, Sept., 1877.

L. B. CASE'S

BOTANICAL INDEX

TO THE

New, Rare and Beautiful Plants,

GROWN AND FOR SALE AT HIS COMMERCIAL GREENHOUSES,

RICHMOND, IND.

VOL. 1.—No. 4. JANUARY, 1878. Published Quarterly, at 25 Cents a Year.

TORREY BOTANICAL CLUB. NEW YORK.

WINDOW GARDENING.

"OH, how beautiful!" we are often led to exclaim, as we pass a window filled with fresh looking plants, during the cold and dreary days of winter, and how naturally we associate pleasure and happiness with them, and in imagination see the cheerful face and careful hand arranging plants; picking a leaf here as necessity may require or training a vine there as fancy may dictate. And now the INDEX will have a little chat with its friends about *their* window garden, and try to give a few useful hints in regard to their treatment, for we will assume the fact that all its friends have at least a few house plants to brighten their homes; and as very few persons are successful in growing them satisfactorily, our experience and observation may be of some assistance to them.

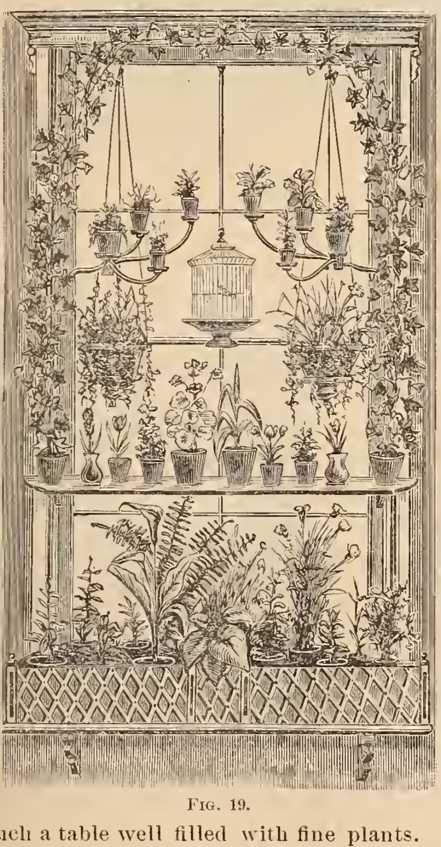

FIG. 19.

With this article we give two designs for a window garden, which we think are the best we have ever seen, both of which are practical and are adapted for every house. Fig. 19 represents a common window, with a shelf, and a frame or fence around it upon brackets, which can be made of cheap material or more costly, as one may choose. We have taken great pains to make this illustration plain, and think it can tell its own story. Fig. 20 is made to represent a bay window, and probably most of our readers have seen its design carried out with good effect. The old mode of keeping plants on an ordinary table or stand is objectionable, being so high as to bring the pot as high as the top of the plant ought to be; and to obviate this, we have had made for our sitting room some tables on rollers, so they can be moved with ease. They are just the height of the window sill, about 18 inches wide, and the length of the window frame; and in this way avoid all danger from dampness to carpets, and being so low they do not obstruct the view from the window. Fig. 21 is a good illustration of such a table well filled with fine plants. (This electrotype was sent to us by a friend, and was probably copied from another work, but we do not know where.) But the care of plants is of quite as much importance as a nice place

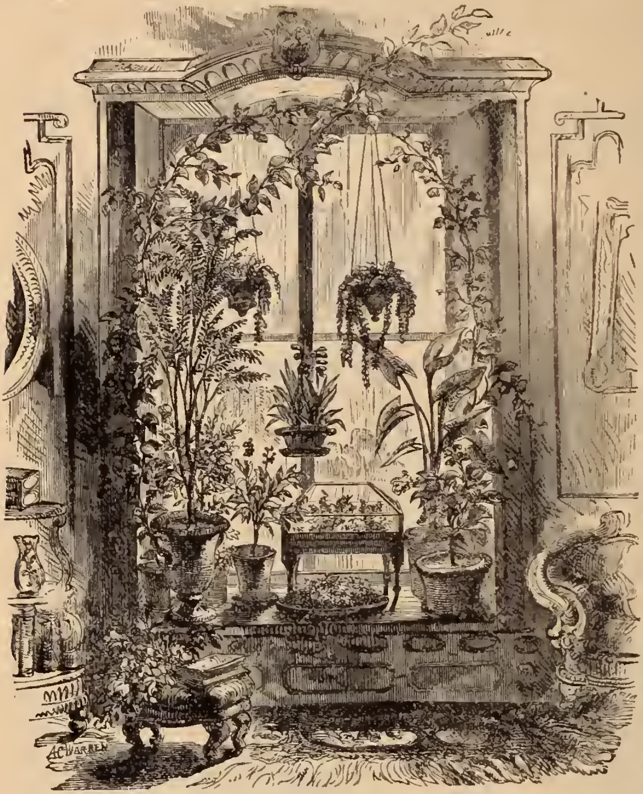

Fig. 20.

to grow them, for if you are not successful in cultivating them in a short time there will not be much pleasure and beauty in them. One of the first troubles met with is the dust that will gather on their leaves, and to guard against it a good plan is to spread over the plants, while sweeping, large newspaper, which is preferable to cloth as it does not allow the fine dust to sift through. However, after all our precaution, dust will gather, and once a week the plants that can be handled should be thoroughly drenched in the sink or bath tub with warm water; some plants are too large to handle, and on them each leaf should be washed with warm, weak soap-suds, using a soft sponge and afterwards washing again with clear warm water. Fresh air must always be given when the weather will permit, at least during the middle of the day; and sunshine is just as necessary during the winter for healthy plants as it is for man, especially if we expect them to bloom; however, after the flowers have opened they should not be exposed to the direct rays of the sun, as the moisture would soon be absorbed and the flower fade. *Begonias*, *Ferns*, etc., will not stand the hot sun in summer, but require it during winter, at least a portion of the time. Watering plants is a very important duty, but very imperfectly understood. In the first place, *Aloes* and *Stapelias* want absolutely no water in winter, unless in bloom, and then very little. *Cactus*, and other succulents, unless in bloom, as well as *Oleanders*, *Pomegranates*, *Figs*, *Crape Myrtle*, etc., that are in the cellar, dormant, want very little water, for very much water would kill the small fibrous roots, and if the plant should survive it will not bloom during the following summer. Ordinary house plants, however, require more moisture, but no rule can be given that will answer as a guide for all kinds of weather and conditions. For instance, if the room is heated by a furnace or base burner stove, the air in the room is so hot and dry that in a very short time all the moisture is absorbed, while an ordinary wood stove does not dry out a pot of earth for two or three days. The best mode of watering is once a week to lay the plant on its side in a sink or bath tub, and thoroughly shower it both on the upper and under surface of the foliage, at the same time completely saturating the pot of earth. Water should never be allowed to stand in the saucers, but must be immedi-

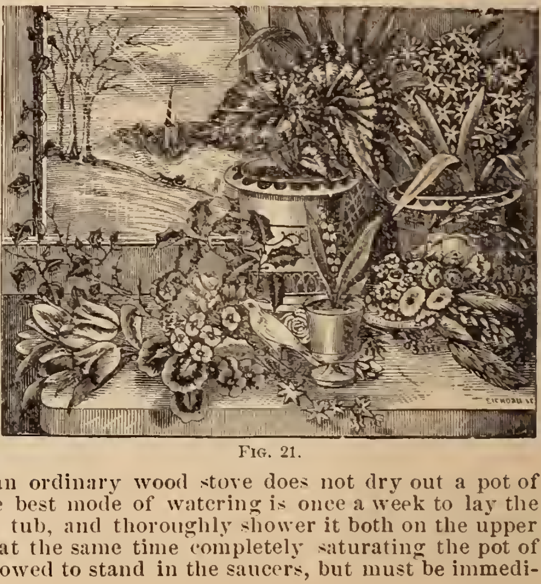

Fig. 21.

ately removed to prevent the earth from souring. Hanging baskets should be showered once a week in the sink, and then allowed to become rather dry. More plants are killed by kindness than neglect, and the kindness usually consists in continually giving the plant a little water, which causes the earth to become sour and pack so hard that it is almost impervious to water. This kills the young fibrous roots that feed the plant, causing it to drop its leaves and die. A very common mistake is using too large pots or boxes to grow plants in, as during winter plants require very little food.

INSECTS are a very serious drawback to healthy and vigorous plants, and a most vigilant watch should at all times be set for them; but in spite of all our care, they will appear and increase with such rapidity that no time should be lost in destroying them. No plants, however, should be taken into the house until thoroughly cleansed. Cultivated plants seem to furnish food for several different species of insects, and the treatment necessary to destroy one form will not answer for another. The black and green fly, or *Aphis*,* are always the most numerous, and are first seen on the new growth of house plants, but in an amazingly short time spread to the older leaves, especially to the soft wooded ones, as well as flowers, absorbing the juice and vitality of the plant. It is easy enough to fumigate a green-house to destroy insects, which of course could not be done in our dwellings, and many plans have been recommended. One says, sprinkle Scotch snuff on the foliage and let it remain two or three days; another says, a weak solution of carbolic acid, applied with a swab or feather; and still another says, take a little coal oil—just enough to make a colored scum on the surface of a tub of water—and dip the inverted plant in it, not allowing the pot to touch it. Others recommend hot water, and we have found that to be the least objectionable. Our plan is to dip the plant in a tub of water that will register 120° with a thermometer, repeating it the following day; of course the plant must not remain in the hot water, as it would be soon cooked. To destroy the green fly in green-houses or conservatories, the most approved method is fumigating, which is done by placing on a pan of live coals a quantity of damp tobacco stems, filling the house with a dense smoke and keeping it closed until morning; but as *Heliotropes*, etc., are liable to be injured by smoke, spread paper over the plants while fumigating. It is better, however, to fumigate two or three nights in succession than to risk too dense smoke. But the most destructive and least known insect is the red spider, *Lettigoniadœ*. It is too small to be readily seen, but its presence is easily detected by grey or yellowish spots on the apparently dying leaves. The little insect lives upon the underside of the leaf, and not only absorbs its vitality but weaves a fine web which closes the pores through which the plant breathes. They delight in a hot, dry atmosphere—just such a one as our sitting room affords—but are readily destroyed by syringing the plant often with clear warm water, or a good bath in the tub, and then sprinkle with sulphur; but if small plates of bright tin or glass, with a little sulphur on them, are placed under the plants, in the full rays of the sun, no red spiders will trouble them, as the sulphur fumes kill them. A weak solution of whale oil soap is excellent, but it must be very weak, or it would not only kill the foliage but the plant also. The mealy bug, *Coccus Adonideun*, is also very destructive to hot-house plants, but is really the easiest to exterminate of any in this list. They are a large white, woolly looking lump in the axil of the leaf, and are easily kept down by frequent syringing with warm, greasy water, to which a little sulphur should be added; but if full grown, they should be picked off by hand or a small sharp pointed stick.

For worms at the roots of plants, an application of a weak solution of carbolic acid, applied quite frequently to the earth, is said to be a sure cure. Another good plan to kill them is to use water with lime dissolved in it for watering the plants; it also aids the soil in stimulating the growth. But probably the safest plan is to carefully shake all the earth from the roots, and after a thorough watering with warm water, repot in fresh earth; but for fear of a like trouble again in a short time, a good plan is to subject the required amount of earth to a strong heat by placing it in an old pan in a stove oven, until all insects as well as eggs are destroyed.

And now we come to the least known, least understood, and apparently the most insignificant insect, but which in reality is the greatest scourge in the whole list; they are the scales, *Coccidœ*, various species, and infest *Cactus*, *Oleanders*, *Camelias*, *Ficus*, and *Tropical Ferns*. Like all other insects, they increase and spread with great rapidity, covering the woody stem and leaves in a short time, and as they are so small and so near the color of the plant on which they feed, they usually get a good start before being seen. A weak solution of whale oil soap is the usual remedy, but the best remedy we ever tried is a boy with a pan of warm water and a stiff tooth brush.

If we go to the green-house or conservatory, as well as ferneries in the house, we shall find the slug or snail are eating large holes or notches in the leaves of all suc-

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*Reaumur has proved that one individual, in five generations, may become the progenitor of nearly six hundred millions of descendants.—HARRIS. Duval, in his experiments, obtained eleven generations of *Aphis* in seven months, being curtailed at this stage by the approach of winter.—PACKARD.

culents, especially *Begonias*, making them unsaleable and unsightly, and as they usually feed during the night, they are not readily detected. The best mode of ridding the house of them is to cut potatoes, turnips, or some other fleshy vegetable, in halves, when they will gather upon them and are easily destroyed.

But we do not wish to become tedious on insects, and will add only the little red ants to the list. They work during the day and usually in communities, and are easily caught by placing something sweet where they can get it; or by sprinkling sugar in a sponge, and then dipping the sponge in hot water.

But we have trespassed upon your patience more than we intended, and ask your indulgence; but when we commence to write upon any of these interesting subjects, we always find it difficult to condense the article and reduce our ideas into as small a compass as we wish, and at the same time convey the ideas we wish to communicate; particularly, as we are continually in receipt of letters asking information upon all these points.

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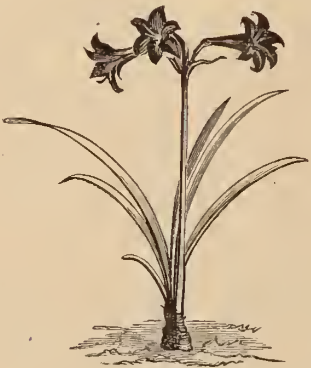


FIG. 22.

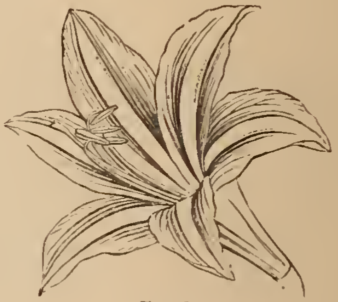


FIG. 23.

THE AMARYLLIS.

WE never tire of talking about or admiring choice plants, especially when the cold, stormy weather of winter limits our observation to the green-house, conservatory, or window garden. But there are some families of plants that all lovers of the beautiful acknowledge as royal, especially when in bloom; and we have selected the order of *Amaryllidaceæ*, as one of the most worthy of the royal family of plants to talk about. All the *genera* are represented by plants of unsurpassed richness, while there is scarcely a species in any of the *genera* that is not worthy a place in any collection; add to this the fact that the order does not produce a baneful or obnoxious plant, so far as yet known. They are distributed all over the known world, but, as with other plants, the finest species are natives of the tropics; but without doubt the most brilliant flowers are produced by the green-house hybrids that are added to the list each year, principally from Europe. The Hon. and Rev. William Herbert, of Spofforth, England, in 1837 published a very exhaustive monograph of the *Amaryllidaceæ*, which must be our guide; however, many of his *genera* are considered not sufficiently distinct, and have been dropped by recent authors.

But before we proceed any further, let us review the *genera* of this order as at present constituted, and enumerate some of the principal ones. They comprise the following genus:

***Order*--Amaryllidaceæ.** *Linnæus.*

Amaryllis, Linnæus. TYPE—*A. Reginæ.*
Agave, Linnæus. TYPE—*A. Americana.*
Brunsvigia, Ker. TYPE—*A. multiflora.*
Buphane, Herbert. TYPE—*A. toxicaria.*
Clitanthus, Herbert. EXAMPLE—*A. Macleanii.*
Clivia, Lindley. EXAMPLE—*A. nobilis.*
Coburgia, Herbert. TYPE—*A. incarnata.*
Crinum, Linnæus. EX.—*Americana and Amabile.*
Cyrtanthus, Aiton. All from Cape of Good Hope.
Doryanthes, Correa de Serra. TYPE—*A. excelsa.*
Galanthus, Linnæus. EXAMPLE—*Snowdrop.*
Gastronema, Herbert. TYPE—*G. clavatum.*
Habranthus, Herbert EXAMPLE—*H. angustus.*
Hæmanthus, Linnæus. TYPE—*H. Amarylloides.*
Hoylockia, Herbert. TYPE—*H. pusfila.*
Hippeastrum, Herbert. EXAMPLE—*H. ambiguum.*
Imatophyllum. EXAMPLE—*A. grandiflorum.*
Ixiolirion, Herbert. EXAMPLE—*A. tartarian.*
Leucojum, Linnæus. EXAMPLE—*Snowflake.*
Lycoris, Herbert. TYPE—*L. straminea.*
Narcissus, Linnæus. EXAMPLE—*Narcissus.*
Nerine, Herbert. TYPE—*N. sarniensis.*
Oparathus. TYPE—*O. Lutea.*
Pancratium, Herbert. EXAMPLE—*P. maritimum.*
Pentlandia, Herbert. TYPE—*P. Miniata.*
Phycella, Lindley. TYPE—*A. obtusa.*
Pyrolirion, Herbert. TYPE—*A. flavum.*
Sprekelia, Herbert. TYPE—*A. formosissoma.*
Vallota, Herbert. TYPE—*A. purpurea.*
Zephyranthes, Herbert. TYPE—*A. Atamasco.*

Besides a long list that are unimportant and seldom heard of.

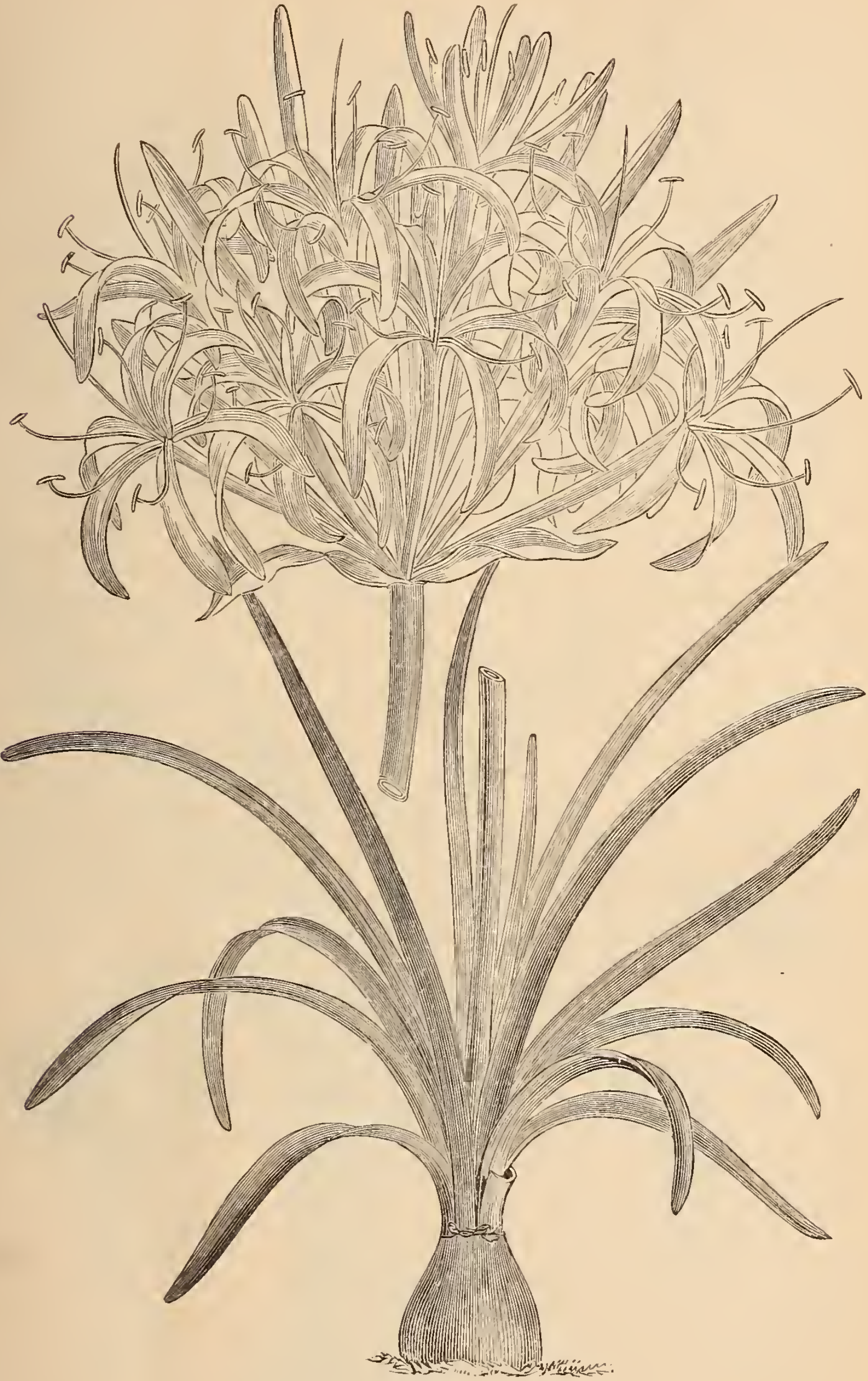


FIG. 24.—*Crinum Prateuse Canaliculatum.*

[From William Bull's New Plant Catalogue, for 1875.]

It will be seen that some of the *genera* are familiar to most of our readers, under the name of *Hardy Dutch Flowering Bulbs*, and as we propose to talk about house plants exclusively, we will take the true *Amaryllis* section for our subject. The *Agave* is also seen to be classed in this family, which may seem very strange to any one not versed in botany, but the scientific botanist finds a never changing law in the flowers and fruit of plants, that separates all plants into Natural Orders; for the characters presented in each plant are as clear to him as the letters forming the alphabet of our language are to the school boy. It is, in fact, a Botanical Alphabet, and the botanist reads "*Order—Amaryllidaceæ*," from the first *Agave* he finds in fruit or flower. We have devoted a large portion of the April number of the Index to an article on *Agaves*, (see page 4.) The flowers of the section we have under consideration are white, yellow, different shades of red, from soft rose to the darkest crimson, and all these colors blended together in stripes or zones; usually bell-shaped, sometimes drooping but oftener standing out horizontally from the stem, and produced in clusters or umbels of from ten to sixteen flowers together, but only three or four flowers usually opening at a time, and each flower lasting four or five days in perfection. These flowers are borne at the end of a tall scape or stem 12 or 15 inches high; and the first flower stem is usually followed by two or three others in quick succession, so that a good plant will remain a long time in bloom; and if the bulbs are not separated, but allowed to mature together, it often happens that half a dozen flowering bulbs are at the same time sending up their flower stems, represented by three or four flowers each, the effect of which is extremely brilliant. A few *genera*, however, produce erect flowers—sometimes in umbels as before described, but often a single flower on a stem six or eight inches high, lasting only one or two days, but followed almost daily by successive new flower stems so as to be in bloom a large portion of the summer, especially if not disturbed until the box or pot is full of bulbs.

No written description can give as clear an idea of a plant or flower as a good picture will do, and we have prepared a few cuts to illustrate the different characters of the several *genera*, which we are satisfied will repay the cost and trouble. Fig. 23 represents the flower of *Amaryllis Reginæ*, a good example of the true *Amaryllis*, and Fig. 22 shows a plant of same; but nothing short of a perfect lithograph could give an idea of its brilliant colors. Figs. 24 and 26 are taken from William Bull's catalogue, and well illustrate the peculiar form and make-up of *Pancratium Rotatum* and *Crinum Pratense Canaliculatum*, two superb species which, however, are very rare in the collection of choice plants of our country, especially in the Northern States, and these are usually in private collections, so that it is not often the mass of plant lovers ever get a sight of them; in fact, they are nowhere a common plant, and in Europe, where nearly all the newly found plants are first sent, the finer species are in the collections of the nobility and a few of the more wealthy commercial plant establishments. The reason for the scarcity of the *Amaryllidaceæ* in American collections is often explained by the difficulty of blooming them under cultivation, but if we study their natural condition it would obviate all our troubles. To bloom any plant successfully, we must first restore it to its natural condition as far as possible, and as collectors usually neglect to tell us all these particulars, it becomes necessary to experiment a good deal to learn how to treat them.

The experience of European plant growers has been pretty well recorded by Sir Joseph Paxton, in his *Botanical Dictionary*, where he tells us: "The bulbs of the stove species should be turned out of the pots in autumn, and laid on the shelf or other dry place till spring, when they should be repotted and introduced into the hot-house, giving them as they progress plenty of water. *A. reticulata* and *A. striatifolia* will not bear turning out, but flower better by remaining in their pots all the year. The green-house species must also be turned out of the pots and dried, and in the spring potted and encouraged to flower. The soil should comprise equal parts of turfy loam and peat, with a fair quantity of sand; the pots should be drained well."

Probably the largest and most successful *Amaryllis* grower in the world is Louis Van Houtte, and as his catalogues are probably not seen by a large portion of our readers, we will republish an extract from his catalogue on *Amaryllis* culture. He says:

"In December, we shift them in pure leaf mould mixed with some sand, shaking off all the mould from the roots without breaking them, and use for that purpose a little stick, by means of which we stir the mould sticking to the roots. We carefully cut out all rotten and broken roots and pass a finger under the disk of the bulb to remove the deteriorated pellicles; but the lateral pellicles, that surround the bulb, never should be removed, even if they but slightly adhere to the bulb; for, as

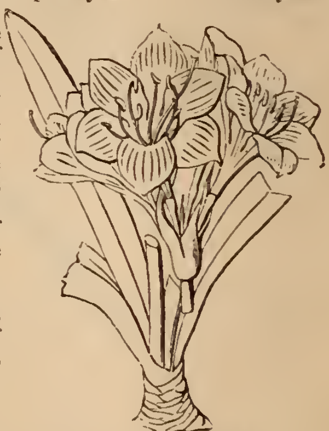


Fig. 25.—*Vallota Purpurea.*

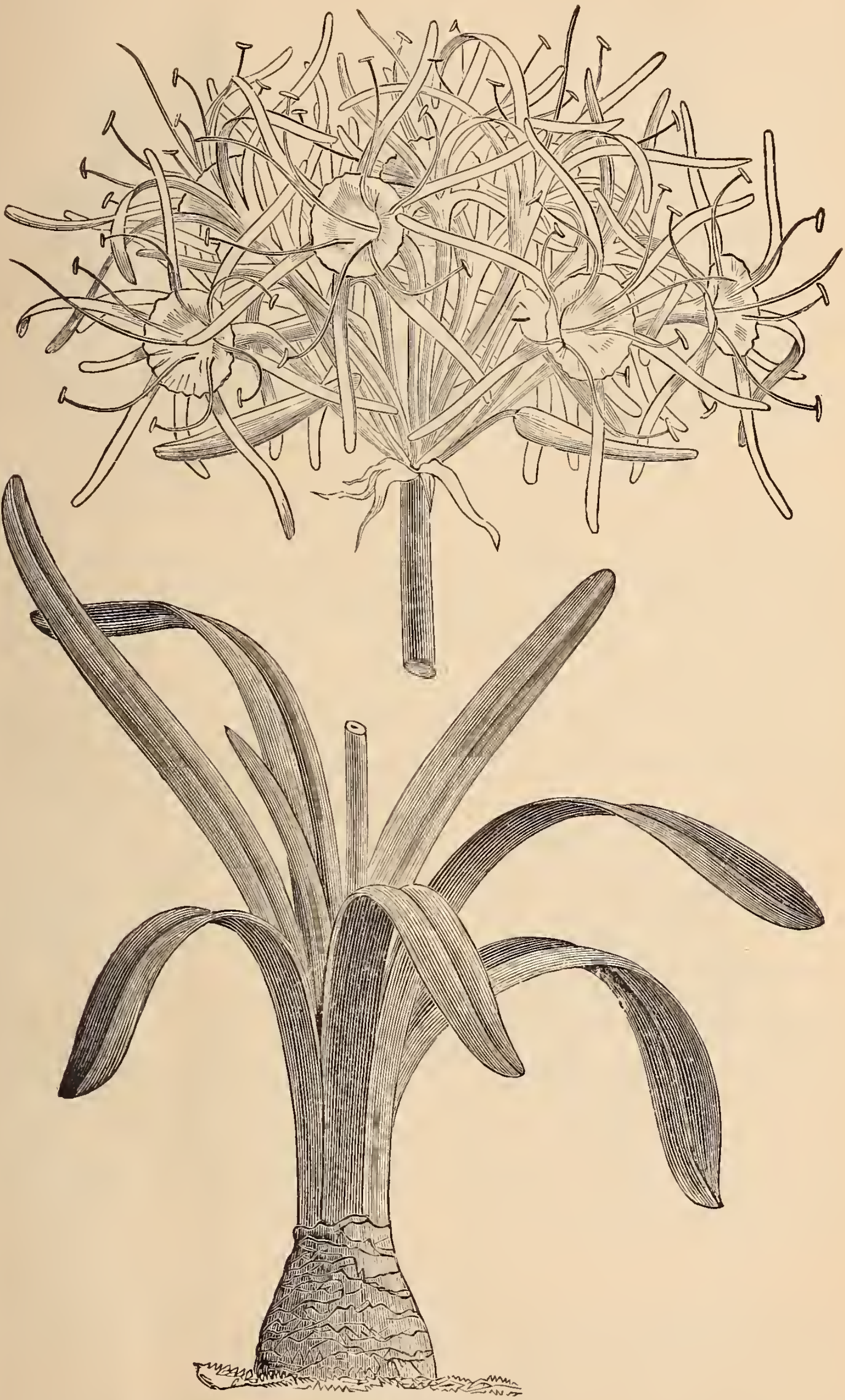


FIG. 26.—*Pancratium Rotatum.*

[From William Bull's New Plant Catalogue, for 1875.]

soon as the bulb is in full vegetation, it regains its firmness and these films will then make an integral part thereof.

"Then we proceed to their planting. A good drainage of potsherds is given, and seizing the top of the bulb with one hand and letting the roots hang down in the pot, we gradually let the mould slip between the roots, till they are all as well as the thicker part of the bulb covered, without pressing the mould too much.

"When potted, they are placed near the glass in a temperate house or stove, without watering them, till they begin to grow, and even then they do not want but little moisture; but as soon as they are evidently in good vegetation, they require an abundant watering. In placing some in the temperate house and some in the stove, they will produce a succession of flowers.

"When flowering, they may be fecundated, but, as soon as this is done, the flowers fade away very soon, and when seeded it is rare to see the same bulb flowering next year. The plant gets exhausted in seeding, and when the seeds are ripe, the bulb will be in such a manner emaciated, that its dress, its pellicles, will be too large, and make it resemble a convalescent who does not fill up his clothes, which before his sickness fitted him perfectly. After having done flowering, we plunge them with their pots in full sun, in garden soil or old tan, and continue watering them as long as the vegetation is vigorous; but afterwards we let the plants content themselves with the rain that falls. In order to prevent earthworms entering the drain-hole, it is advisable to withdraw the pot from the hole wherein it is to be plunged and make a second hole at the bottom of the large one, so that the drain-hole does not touch the soil. As soon as the atmosphere and rains are getting cold, they are brought back to the temperate house and placed upon an elevated shelf; no water is given them, for now begins their time for resting, which is quite indispensable if a fine show of flowers is desired for next year.

"The *Amaryllis* may also be shifted after their flowering season, but then much care should be taken not to break the young fragile roots. This praxis sometimes produces a more luxuriant blossoming, as if they had been shifted in December. When planted, the pots are for some time placed in the shade, under some trees, until the sky gets covered or rain is to be expected; then they are plunged in the same way as described above.

"We say that the shift, after the blossoming time, may cause a more vigorous blooming, whilst it may be uncertain when potted in December. For, in potting them after their blossoming time, the plants will be well rooted in their pots at the beginning of the winter. If they, during the winter, remain in this state, the plants will be well established when they emit their flower-stems. If, when shifted in December, sufficient care should not be taken, too high a temperature sometimes provokes too early an emittance of leaves and flower-stems, before the new roots are able to support them, and consequently no rich bloom can be produced."

Our experience is, that to mature large, healthy bulbs, as well as to encourage the formation of new ones, they must be planted deep; that is, cover the whole bulb with earth even with the crown, so that the base of the leaves just touch the earth. But for blooming, they should be planted very shallow or even on the earth, and require the roots to hold the bulb in place, which it does very readily, as they send out such great quantities of long and strong ones.

For house culture, all the species of *Amaryllidaceæ* are desirable, but the true *Amaryllis* are especially choice pot plants, and we would recommend for amateurs, *A. alba*, *A. atamasca*, *A. aulica*, *A. Belladonna*, *A. formosissima*, *A. Johnsonii*, *A lutea*, *A. purpurea* (Fig. 25) which often blooms both in spring and fall, *A. Prince of Orange*, *A. reginæ*, and *A. rosea*. All these varieties can be procured of almost any large plant dealer in the United States, but as there are not to our knowledge any commercial plant establishments in the United States that make a specialty of growing them, many of the choicest varieties may be difficult to obtain; but any florist can order from Europe any species not to be found in the United States, or we will undertake to furnish any species or genus named in this article. All orders must be received before the first of March, as the months of April and May are the safest months for importing plants.

California Ferns.

We have taken the liberty of publishing the following list of Ferns collected near Santa Cruz, California, from a private letter by a lady correspondent, as it will interest all plant lovers. We will book orders now for any of these species, to be forwarded during April and May:

Asplenium Filix-fœmina,
Aspidium aculeatum,
" *argentum*,
" *unitum*,
Adiantum Chilense,
Cystopteris fragilis,
Gymnogramme triangulare,
Pellæa Andromedifolia
Pellæa ornithopers,
Polypodium intermedium,
Pteris aquilina var lanuginosa.
Woodwardia radicans.

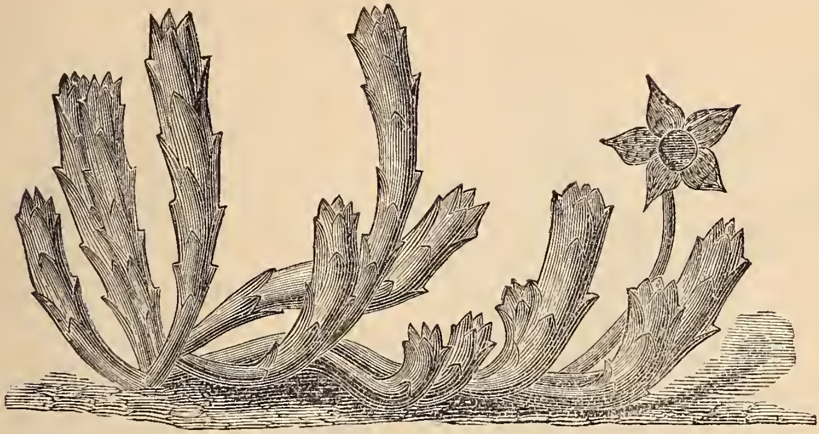


FIG. 27.—*Stapelia Serpentina.*

STAPELIA.

IT is always a matter of surprise to see the strange forms nature assumes in the Vegetable Kingdom, especially when looking over a collection of plants just received from a newly discovered country. It is not the good fortune, however, of all plant lovers to enjoy the feast of good things alike, and many of us must content ourselves with reading of instead of owning them. We have selected from this number, (and "their name is *legion*,") one of the commonest forms of these curiosities to talk about in this number—the *Stapelia*—because within the past few years they have been introduced into our plant establishments rather freely and occasionally purchased for private collections, which may make a short article about them more acceptable.

In the natural order of the Vegetable Kingdom, the *Stapelia* are classed by botanists in the *Asclepedacœ*, which are represented with us by the common milkweed of the road-side; and the *Stapelia* are just as noxious in their native country as the milkweed is with us. There are about one hundred species known to botanists, all of which are from that land of vegetable wonders—the Cape of Good Hope.

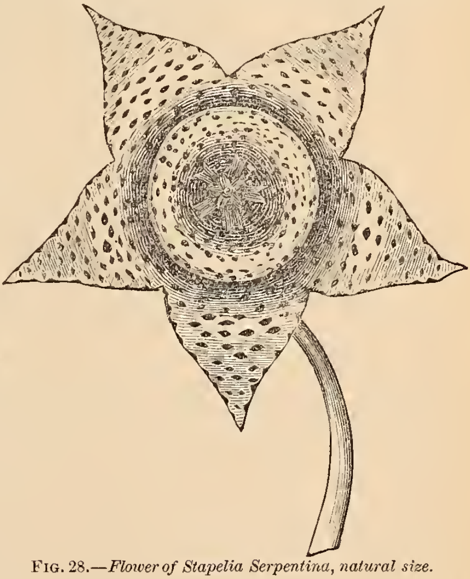


FIG. 28.—*Flower of Stapelia Serpentina, natural size.*

At the head of this article we give an illustration of a plant of *Stapelia Serpentina*, (Fig. 27), as it is seen in our greenhouses, and in Fig. 28 we give a cut of its flower, natural size. It would be very difficult to give a perfect description of the flower, and we will only say, it is of a dark velvety-brown color, with yellowish spots irregularly scattered over its surface, giving it a peculiarly grotesque dotted or marbled appearance, reminding one very much of the skin of a reptile; but the flower has the odor of carrion upon a too close inspection. The genus of *Stapelia* present two forms of growth—a creeping and an erect form—and *Stapelia Serpentina* is a good example of the creeping varieties, both in growth and flower. They are composed of thick fleshy or lumpy four-sided stems, about six inches in length, without leaves, and along the angles of the stem are prominent notches or teeth, from which spring soft thorn-like tubercles, giving the plant a cactus-like appearance.

But the erect growing section, of which *Stapelia Asterias* is a good example, are by far the handsomest varieties. Fig. 29 well illustrates a flower and small portion of the stem of *S. asterias*, and is a good example of this section. The flower is of a deep

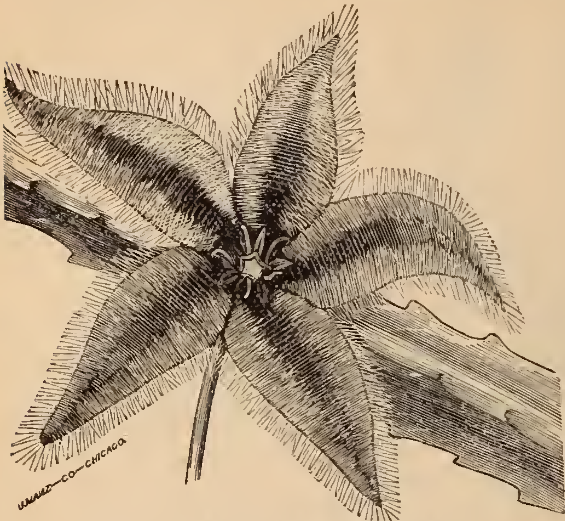


Fig. 29.—*Flower of Stapelia Asterias, natural size.*

violet purple, without spots, but thickly set upon its inner surface, with fine cilia or hair-like fringe nearly an inch long and of a grayish color, often giving to the flower a changeable appearance. Unlike the creeping varieties, the flowers of this section have very little or none of the fetid odor, and are therefore more desirable for house culture. The plant of *S. asterias* is said to be the finest of all the species, by English botanists. This section has erect, straight, square, branching stems, growing eight or nine inches high, of a light green color, and covered with a grayish down or bloom, with notches and tubercles as in the creeping section, while the flower stems usually spring from these tubercles.

Sir Joseph Paxton tells us: "The soil best suited for them is sandy loam and old brick or lime rubbish. The pots should be well drained, and the plants at all times carefully watered, except in winter, when they must be kept in a perfectly dry state. They are readily increased by cuttings, which should if possible be taken off only in spring, when the plants are dormant. They should be allowed to dry for a few days after they are taken from the mother plant, after which they may be planted in separate pots in the same compost as before recommended, when they will strike root in a very short time."—*Botanical Dictionary*, p. 35.

The peculiar grotesque appearance of the plant, especially when in flower, will recommend it to all lovers of curious plants; and by following the above directions, they will be found to be of the easiest possible culture.

MISCELLANEOUS.

Ancient Use of the Roots of the Lily as an Article of Food.

Very few people realize the rapidity with which the old land-marks of the former occupants of America are disappearing, and a still smaller number ever stop to learn what is still knowable of many an interesting spot, which, if carefully studied, would add pages of information to the history of pre-historic America, but which in a short time will be entirely obliterated and contribute nothing to our knowledge of those mysterious people of which we are all so anxious to learn. One of these interesting localities is the banks of the Kankakee river, especially in Starke, Porter and La Porte counties, Indiana; and the objects of special interest here are basins, or, as they are usually called, "pot holes," dug out of the ground only a few feet from the river bank, and usually in the black muck ground, where the banks are from two to six feet above the river bed in low water, but are often overflowed during spring and fall, so they do not indicate the site of a permanent location. These basins are about eight feet in diameter and three feet deep, the bottom being covered with a layer of broken granite, sandstone and limestone; however, there are no stone in place for quarrying within a long distance, and the prairies are low and swampy, with only a very few scattered boulders, or "nigger heads," as they are popularly called, to be found, which would probably indicate the stone were brought by the people on their periodical trips, from a distance. There are usually from ten to fifteen basins in a group together, with only space enough between to allow of a narrow path around each one; but sometimes no more than three or four are found together, while as high as thirty are found in rare locations.

From an old settler, Mr. John Lindsley, who died in 1873, we learn something positive of the origin and uses of these basins. He said they were dug out by the Indians, and used as a place for preparing the roots of the Water Lily for food. He described the mode of preparing it, as has often been done before by travelers among primitive people, which to American archæologists is a very interesting point as connecting the manners and customs of the present Indians with the Mound Builders. He said the roots were collected from the river close by and thrown into these basins, partly filled with water, and boiled by means of stone heated in a strong fire near by and thrown into the basin until the roots were thoroughly cooked. The stone, after cooling in the water, was again returned to the fire and heated as before, until the heating and sudden cooling caused them to burst into pieces, and these pieces are still in the basins as witnesses of their former use. When a blanket could be procured it was spread over the basin to prevent the escape of the steam to assist in cooking; but the scarcity of blankets, or in fact anything they could obtain for a covering, prevented their general use, which is not essential to a successful preparation of these roots for food. Mr. Lindsley did not remember the species of the so-called Water Lily, but probably it was the same as is described in the Annual Report of the Department of Agriculture, for 1870, on page 407, where, in the article on Food Products of the North American Indians, the yellow Pond Lily (*Nuphar advena*) is enumerated among the number, and the writer, who was evidently familiar with the subject, describes their mode of gathering and preparing it for use. He says: "The roots grow four or five feet deep in water, and Indian women dive for them, obtaining large quantities, one or two feet long. They are very porous, slightly sweet and glutinous, generally boiled with wild fowl, but often roasted. Muskrats store large quantities of these roots in their dwellings for winter use, which the Indians contrive to steal. The plant is called *Tak-wah-pah* by the Dacota Indians. The seeds form an important part of the diet of the Klamath Indians of California, and when pulverized they are made into bread or gruel, but are often parched and eaten as pop-corn."

Successful Florist.

It is always a pleasure to know that our customers are successful in raising good plants, and especially plants for exhibition, sent by us a long journey through the mail. The following private letter from Mr. Meyer, although intended as an acknowledgement to us for first sending good plants, is the best evidence that Mr. Meyer is a No. 1 plant grower, and must be a successful gardener. We wish him success and prosperity in his business:

New Orleans, July 24, 1877.

L. B. Case, Esq., Richmond, Ind.

Dear Sir: On the 19th inst. I mailed you the New Orleans *Democrat*, and to-day send you the New Orleans *Picayune*, and request your kind attention to the report of the "Fruit Growers' Fair," by which you will see that the diploma for the finest collection of pot plants was awarded to me. The plants exhibited were only such as were imported from you—*Coleus* and *Caladiums*—and I can state they made a glorious display. The first diploma for the *largest* collection (not for the *finest*) of plants, was awarded to the treasurer. Hoping the above will interest you, I remain,

Yours, very truly, GEO. MEYER.

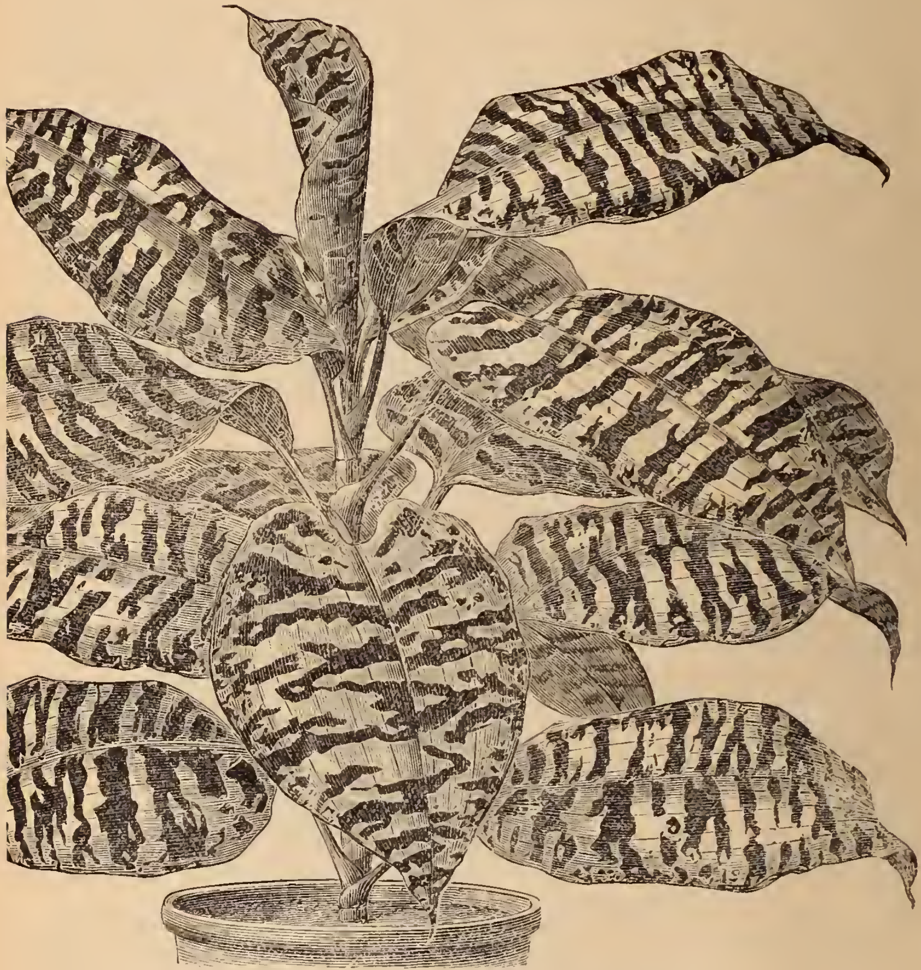
American Lotus.

We are now prepared to furnish seed of this choice Aquatic Plant, (*Nelumbium luteum*,) the *American Lotus*, collected in Northern Indiana and Michigan, at 50 cents a package. Also, seed of *Desmanthus* (*Darlingtonia*) *brachyoloba*, a beautiful, acacia-like, hardy ornamental shrub, at 25 cents a package.

We take pleasure in returning thanks to a few of our friends that have favored us with Seeds or Plants from the new and unfrequented parts of the United States. Among these, we particularly wish to mention Lieut. Hugh T. Reed, 1st Infantry U. S. A., Montana; Geo. Springer, Arizona; J. E. Johnson, Utah; C. J. Croft, Colorado; Mrs. S. C. Willoughby, Washington Territory; A. H. Curtiss, Florida, and H. Case, San Diego, California.

We feel justly proud of the mechanical work on this number of the Index, and take great pleasure in recommending Messrs. Manz & Co., Chicago, the wood engravers that prepared nearly all our illustrations, and whose card appears on page 54, to the consideration of Florists and Botanists who may wish wood cuts for their publications. Also, the Telegram Printing Co., Richmond, for the neat and accurate typographical work on this, as well as on all their publications.

NEW PLANTS.



DRACÆNA GOLDIEANA

"One of the most magnificent ornamental-foliaged plants ever introduced, and altogether unique in character and aspect. It is a native of Western Tropical Africa. The plant is of erect habit, and the stems are closely set with stalked spreading leaves, the petioles of which are of a grayish color; the blade of the leaf is cordate-ovate acuminate, with a yellowish-green costa, and marbled and irregularly banded with dark green and silver-gray in alternate straight or furcate bands, the colors being about equally distributed. The back of the unfolded leaf is a pale reddish-purple color. It is, without doubt, one of the most superb of ornamental stove plants, and indispensable in all first-class collections."

The foregoing description of this beautiful plant is taken from William Bull's new Plant Catalogue, 1877; but the plants at the time were not offered for sale, for it was the original design to not sell any until 1878. But under date of Oct. 24, 1877, Mr. Bull writes: "I have had so many enquiries for it, that instead of waiting for 1878 I have sent it out this autumn, and am already sold out of the smallest size, and do not expect to have any more until next spring." We are now prepared to book orders for plants, to be forwarded in April and May, at $4.00 each.

We are under special obligations to William Bull for the use of the above cut.

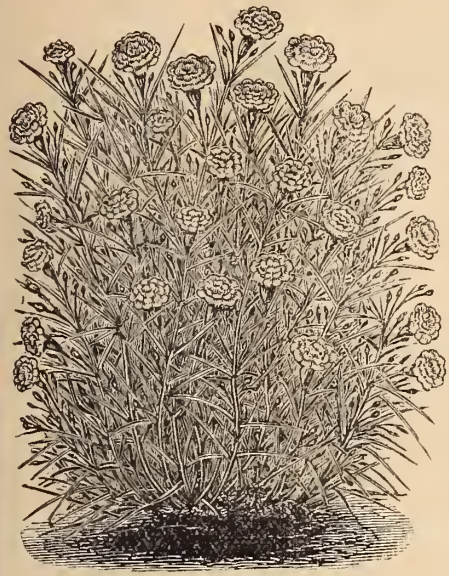


FIG. 31.

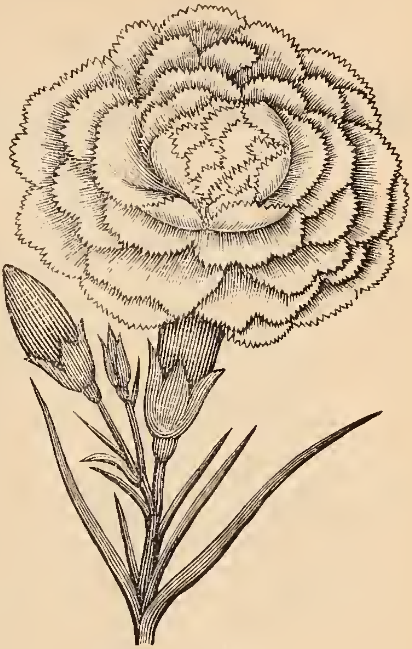


FIG. 32.

NANZ & NEUNER'S
NEW, DOUBLE, WHITE, PERPETUAL BLOOMING CARNATION,
"PETER HENDERSON,"

This choice novelty was raised from seed, by Mr. John Charlton, of Rochester, N. Y., and purchased by Nanz & Neuner, who now after a thorough trial offer it to the public, with the assurance that its many excellent qualities may enable it to supersede all other white Carnations now introduced. The plant is of a strong-growing, dwarf, compact habit, with rich, dark foliage, producing an immense number of flowers, both in winter and summer, being in fact as well as in name a perpetual blooming Carnation. The flowers are usually 2½ or 3 inches in diameter, or nearly double the size of any other variety; fine form, pure white, extra fragrant, and never bursts the calyx, which is the usual rule for all carnations, but the flower remains bright and fresh on the plant for over two weeks. The illustrations are from photographs of a one-year-old plant, grown with only ordinary care, yet it had at the time the photograph was taken nearly 200 flowers and buds ....50c. each.

NEW ABUTILONS.

The following *Abutilons* were raised by A. K. WILLIAMS, of this place, the result of crosses between *A. Darwini* and the older varieties; they combine in a great degree the extreme freedom of bloom which characterizes the former, with distinct flowers and more vigorous habits. They are by far the finest colored-flower varieties of *Abutilons* ever offered:

A. Belsham, clear carmine-crimson, without markings on outside; color brilliant and attractive; flowers large and of good form; vigorous habit; a novel and distinct *Abutilon* ... . 50c. each.

J. H. Skinner, a most profuse bloomer; clear reddish-salmon; a distinct and free flowering variety; will make an excellent bedding plant........... .. .. 50c. each.

Joseph Hill, beautiful deep orange, with purple veining; flowers broad and open, beautifully marked in the center; a vigorous grower ....50c. each.

L. B. Case, flowers of good size and form; color crimson-red, veined with purple; of vigorous habit and a very free bloomer .. .. 50c. each.

Robert George, a free and continuous bloomer; flowers broad; their large, overlapping petals incurved, presenting a beautiful appearance; color orange, veined crimson ....50c. each.

L. B. CASE'S

Retail Price-List of Plants.

Abelia rupestris	$ 50
Abutilon Boule de Niege	35
“ Darwinii	25
“ Mesopotamicum pictum	20
“ Thompsonii	25
“ Perle d'Or	30
Achænia malvaviscus	25
Achyranthus aurea reticulata	15
“ Borbonica	25
“ Caseii	20
“ Gilsonii	25
“ Lindenii	25
“ “ variegata	20
“ Verschaffeltii	25
Achillea rubra	15
“ Ptarmica	25
“ Tomentosa	15
Acorus graminus variegata	25
Adhatoda cydoniæfolia	50
Agapanthus umbellatus, (African Blue Lily)	50
Agave Americana	25
“ “ variegata	50
“ Applanata	1.00
“ Sislandi	50
“ Yuccafolia	1.00
Ageratum, Dwarf Imperial	15
“ Mexicanum	15
“ “ variegatum	20
Akebia quinata	25
Alamanda cathartica	30
Alocasia atropurpurea	50
“ Gibsonii, or Illustris	1.00
“ Javanicum	50
“ Jenningsii	1.00
“ Odorata	1.50
Aloe alba picta	30
“ Aspersa	50
“ Cooperii	1.00
“ Latifolia	1.00
“ Lingua	50
“ Margaritifera	50
“ Serratifolia	25
“ Soccatrina obliqua	30
“ “ umbellata	30
“ Variegata	75
“ Verrucosa	25
Aloysia citriodora, (Lemon Verbena)	20
Alternanthera amœna	10
“ Amabilis tricolor	10
“ Latifolia	10
“ Spathulata	10
“ Versicolor	10
Amaryllis alba	75
“ Atamasco	30
“ Formosissima	25
“ Johnsonii	50
“ Lutea	15
“ Prince of Orange	50
“ Regina	1.00
“ Rosea	75
Amorphophallus Rivierii	75
Anthurium magnificum	50
Aquilegia vulgaris, (Columbine), double and single white and purple	25
Aralia speciosa, (Hercules' Club,)	25
Arundo conspicua	50
“ Donax variegata	75
Aristolochia tomentosa, (Dutchman's Pipe)	50
Artemisia argentea	20
“ Blanch	20
“ Stellaris	25
Asclepias carassavica	25
Aspidistra lurida variegata	30
Astilbe Japonica	25
“ “ variegata	50
Balm, Gold and Silver variegated	10
Bambosa argentea	50
Banana. [See Musa.]	
Basella rubra variegata	25
Begonia Aug. Sunderbruch	75
“ Argentea	25
Begonia argentea punctata	$ 25
“ “ hybrida	25
“ Carolinæfolia	50
“ Capensis	50
“ Dædalea	25
“ Elegans	35
“ Eldorado	35
“ Emma	50
“ Emerald	35
“ Eximia	35
“ Feastii	50
“ Froebeli	2 00
“ Frederick Scigmeyer	35
“ Grandis	35
“ Grace Fahncstock	35
“ Griffithii	25
“ Glaucophylla scandens	25
“ Humboldtii	25
“ Hydrocotylifolia	25
“ Heraclifolia nigricans	35
“ Imperialis	50c. to 1.00
“ Imperiator	25
“ Inimitable	35
“ Inspector Otto	25
“ Knerkii	75
“ La Favorite	25
“ Leopold Ist	25
“ Lord Palmerston	25
“ Longifolia	25
“ Lucy Heaver	25
“ Madame Alwardt	35
“ Madame Perrier	30
“ Madame Revere	25
“ Madame Wagner	25
“ Manicata	25
“ Marshallii	35
“ Marmorata	35
“ Marginata	35
“ Matilda	25
“ Miranda	25
“ Miss Helen Buist	25
“ Mrs. Stewart Lowe	25
“ Nebulosa	35
“ Philadelphia	25
“ President Vanderheit	25
“ Prince Albert	25
“ Pruenosa	35
“ Queen Victoria	25
“ Queen of Hanover	40
“ Quadricolor	25
“ Rex	35
“ “ magnifica	25
“ Ricinifolia	50
“ “ maculata	25
“ “ nigricans	25
“ Rollinsonii	25
“ Rosedale	50
“ Reichenheimii	50
“ Smaragdina	75
“ Silver Queen	25
“ Silver Chain	40
“ Schœne Von Oberyenne	35
“ Subpeltata nigricans	30
“ Splendens	35
“ Tryphilla	25
“ The O'Donohue	35

BEGONIAS—SHRUBBY VARIETIES.

Begonia Alida	$ 25
“ Argyrostigma	25
“ Boliviensis	25
“ Carminata	25
“ Chambersii	1.00
“ Discolor	15
“ Diversifolia	25
“ Dreggii	20
“ Digswelliana	25
“ Falcifolia	25
“ Fuchsioides	25
“ “ alba	25

Begonia Foliosa	$ 25
“ Hybrida multiflora	15
“ Incarnata	15
“ “ variegata	35
“ Incana	50
“ Nitida	25
“ Odorata	25
“ Oilifolia	15
“ Parvifolia	20
“ Palmata	25
“ Parnelli	75
“ Rosæflora	1.00
“ Richardsonii	25
“ Sanguinea	25
“ Saundersii	25
“ Semperflorens	25
“ Sedeni	30
“ Sutherlandii	30
“ Verschafeltii	25
“ Washingtonii	25
“ Weltonensis	25
“ Zebrina	20
Bocconia Japonica	25
Bohemeria argenta	35
Bouvardia Leantha—flowers dazzling scarlet	25
“ Hogarth—flowers rich scarlet	25
“ Triphilla—flowers rosy pink	25
“ Elegans—flowers scarlet carmine	25
“ Vreelandii—white flowers	35
“ Jasminoides—flowers white	35
Brugmansia Knightii	25
Cacalia articulata	25
“ Glauca	25
Calla Æthiopica. (Lily of the Nile)	50
“ “ Nana, (dwarf variety)	40
Caladium Albonervium	75
“ Alphonse Karr	75
“ Beethoven	1.00
“ Brogniartii	75
“ Duc de Ratiho	2.00
“ Max Kolb	75
“ Pœcile	75
“ Sedenii	1.00
“ Wightii	75
Callistemon lanceolatum	50
“ Floribunda	50
Campylobotrys Ghiesbrectum	25
“ Refulgens	25
Canna Brenningsii	50
“ Discolor	25
“ Gigantea	25
“ Marechal Vailliant	25
“ Ne Plus Ultra	30
“ Nigricans	25
“ Pius IX.	25
“ Porleana	25
“ Promice de Nice.	25
“ Rubra superbissima	35
“ Spectabilis	20
“ Tricolor	50
“ Warczewiczii	25
“ “ rosea	25
“ Zebrina	25
“ “ nana	25
Carnation La Belle	35
“ La Purite	25
“ “ variegata	50
“ Mineata	25
“ President de Graw	25
“ Peter Henderson, (see New Plants)	50
“ Vailliante	25
Centaurea argentea	20
“ Candidisima	25
“ Gymnocarpa	25
“ Plumosa	25
Centradena grandiflora—flowers pink	25
“ Rosea—flowers rose color	25
“ Floribunda	25
Cereus crenulatus	1.00
“ Cylindricus	50
“ Erisophorus	1.00
“ grandiflorus	30
“ Longissimus	30
“ McDonaldii	50
“ Monstrosa	25
“ “ formosa	40
“ Paucispinus	50
“ Repens	35
“ Serpentinus	25
“ Speciosa	30
“ Tortuosa	1.00

Cestrum auranticum—orange	$ 25
“ Laurifolium—white	25
“ Parqui—green	25

CHRYSANTHEMUMS.

Pompone—20c. each.

Boh—crimson red.
Eliza Strong—lemon, carmine tips.
La Fiance—white, serrated petals.
Lunail—white, purple tips.
M. Schmidt—bronze yellow.
Pink Perfection—soft pink.
Travenna—white.

Large Flowering—20c. each.

Emperor of India—fine white.
Jomina—purplish pink.
Josiah Wedgwood—rosy carmine.
Mrs. Brumless—red, yellow tips.

Japan or Fringed Varieties--25c. each.

Abd-el-Kadar—crimson maroon.
Admiranda—flesh color.
Cry Kong—sulphur, carmine tips.
Erecta superba—canary yellow.
Jane Salter—white, striped rosy lilac.
Kang Kang—bronzy yellow, lilac shade.
Laciniatum—pure white.

Cineraria Artemecioides	35
“ Candida	35
“ Centaurifolia	35
“ Compacta	35
“ Erecta	35
“ Maritima	25
“ Nana	35
“ Pendula	35
“ Success	35
“ Tomentosa	35
Cissus albo-nitens	15
“ Discolor	50
“ Lindenii	50
Clerodendron fragrans—flowers white	50
“ Bungeii—flowers pink	30
“ Belfori—climber	50
Cobæa scandens	40
“ “ variegated	50
Cocolobia platyclada	25
Columnea Schiedana	25
Colocasia (Caladium) esculentum	40
“ “ Bataviensis	40

Coleus—20c. each, unless noted.

Acis.
Admiral.
Ajax.
Albert Victor.
Autumn.
Aurea Marginata,
Beauty of Widmore.
Beauty of St. John's Wood.
Brilliant.
Blackamoor.
Charm.
Chameleon.
Crown Jewels.
Duke of Edinburg.
Eclipse.
Flora.
Glow-worm.
Golden Beauty.
Golden Pheasant.
Grand Duke.
Hero.
Her Majesty.
Meteor.
Merrimac.
Miss Nightengale.
Nellie Grant.
Oriole.
Peerless.
Prince Leopold.
Prince Arthur.
Princess of Prussia.
Princess Royal.
Refulgens.
Richmond Beauty.
Setting Sun.
Scottii.
Surpasse Chameleon.50
Sultan.
Sunbeam.
Sylph.
South Park Beauty.
The Mandarin.
The Shah—40.
Verschaffeltti.
Velvet Mantle.
Zanzibar.

Corræa alba—flowers white	50
Convolvulus Mauritanicus	25
“ Palmatus	25
Conoclynum Xanthinum	25
Cotyledon arborescens	15
“ Orbiculata	25
“ Coruscans	15
Crassula arborescens—flowers roseate	25
“ Ciliata—flowers white	25
“ Gracilis	15
“ Lactea	15
Crape Myrtle—white	50
“ Red	25
Crinum Americanum	75

Cuphea hyssopifolia	$ 25
“ Danilissima	15
“ Platycentra	20
“ Emiuens—winter flowering	20
Curculigo recurvata variegata	3.00
Cyperus alternifolius	15
“ “ variegatus	50
Deeringia Amhersti variegata	25
Dianella latifolia	25
Dielytra spectahilis—flowers crimson & white	15
Diosma fragrans	15
Dracæna Australis	35
“ Baptisti	2.50
“ Brazilieusis	50
“ Chelsonii	2.50
“ Congesta	25
“ Cooperii	50
“ Draco (Dragon Tree)	2.00
“ Ferrea	1.00
“ Fragrans	50
“ Haageana	1.00
“ Indivisa	50
“ “ marginata	1.00
“ Odorata	50
“ Terminalis	30
Echeveria grandiflora	20
“ Metallica	50
“ Pulverulenta	50
“ Retusa floribunda	30
“ Rotundifolia	25
“ Sanguinea	15
“ Secunda	15
“ “ glauca	30
Echinocactus multiplex	25
“ Eyresii	25
“ Emoryii	50
“ Ottonis	35
Eranthemum aspersum	50
“ Elegans	30
“ Pulchellum	25
“ Tuberculatum	35
Erythrina Crista-Galli	75
“ Caffra	1.00
“ Herbacea	75
“ Versicolor	1.00
Eucharis Amazonica (Amazon White Lily)	75
Epiphyllum Ackermanii	25
“ Phyllanthoides	25
“ Truncatum crenatum	25
“ “ violaceum	25
Euonymus Japonicus	10
“ “ Argenteus	25
“ “ Aurea variegata	50
“ “ Aurea marginata	30
“ “ Ovata	50
“ “ Tricolor	75
“ Radicans variegata	25
Eupatorium arboreum	25
“ Angustifolium	25
“ Elegans	25
“ Riparium	25
Euphorbia Brionii	25
“ Jacquiniflora	50
“ Pendula	20
“ Spinosa	30
“ Splendens	25
Farfugium grande	35
“ Ligatum variegatum	35
Feverfew Double White	15
“ Golden	15
“ Prince Alfred	15

FERNS FOR THE HOUSE, (TENDER.)

Acrostichium Alcicorne	1.00
Adiantum (Maiden Hair) Affines	25
“ “ Capillus veneris	25
“ “ Callopodes	25
“ “ Cuneatum	25
“ “ Concinum	25
“ “ Decorum	25
“ “ Farleyense	5.00
“ “ Formosum	25
“ “ Kuhneatum	25
“ “ Macrophyllum	1.00
“ “ Pedatum	25
“ “ Pubescens	25
“ “ Recurvatum	25
“ “ Tinctum	25
Aspidium Felix-Mass-Cristata	25
“ Molle	25
“ Strigulosum	25
Asplenium Belangerii	$ 50
“ Ebeneum	25
“ Fabianum	50
“ Ruta-mararia	35
“ Trichomanes	25
Blechnum glandulosum	25
Camptosorus rhizophyllus	25
Cheilanthus Californicum	50
Cystopteris obtusa	30
Davillia polyantha	40
Doodia blechnoides	50
Lygodium scandens	50
Microlepsis scabra	25
Nephrodium exaltatum	50
“ Molle	25
Onychium Lucidum	40
Phlebodium aureum	50
Platyloma cordata	50
Polypodium Billardi	25
“ Pustulatum	25
“ Peltidium	25
“ Vulgare	25
Polystichum falestum	40
Pteris adiantifolium	50
“ Argyra	1 00
“ Cretica albo lineata	50
“ Gigantea	1.50
“ Grandulosum	40
“ Longifolium	25
“ Palmata	50
“ Semi-pinnate	25
“ Serrulata	15
“ “ eristata	25
“ Tremula	40
“ Tricolor	1.00
“ Umbrosa	50
Scolopendrium crispum	25
“ Fissum	50
“ Vulgare	25

In addition to the above lists of tender Ferns, we can furnish about one dozen varieties of hardy Ferns at prices ranging from 10c. to 25c. each.

Ficus Australis	75
“ Carica (Fig)	30
“ Elastica	75
“ Japonicus	25
“ Macrophylla	1.00
“ Nitida	50
“ Parcellii	1.50
“ Repens	25
Fittonia Argyroneaura	20
“ Gigautea	20
“ Marginata	20
“ Pearcei	20
“ Verschaffeltii	20
Fragaria Indica	20

FUCHSIAS.

With Single Corollas—(20c. each, unless noted.)

Annie, white and rose colored.
Arabella Improved, white and rose.
Aurea Superba, salmon and scarlet.
Bernice, red and purple.
Bianca Marginata, rose and flesh color.
Carl Halt, rose and white, striped.
Cherub, white and soft rose.
Clapton Hero, scarlet and crimson.
Coccinea Rosea, blush white and rose.
Corymbifolia, scarlet
Criterion, coral red and blue.
Day Dream, scarlet and violet blue.
Diadem de Flora, white and pink.
England's Glory, white and rose.
Fulgens, scarlet.
Gracilis Floribunda, scarlet and plum.
Jolly, white and carmine.
Karl Kahl, red and brown.
Little Alice, scarlet and white—30c.
“ Harry, scarlet and mauve blue—30c.
Lustre, coral-red and orange.
Microphylla, scarlet and purple.
Mrs. Marshall, blush white and rose lake.
Pracocera.
Prince Imperial, dark purple and scarlet.
Procumbens, orange yellow.
Queen of Hanover, white and rose.
Racemosa, orange scarlet—$1.00.
Reine Blanch, white and salmon rose.
Rose of Castile, white and violet rose.

Schiller, white and crimson purple.
Speciosa, blush and scarlet.
Striata Perfecta, white and carmine, striped.
Turban, plum color and white.
Vanquer de Pueblo, deep pink.
Wave of Life, scarlet and violet blue.
Warrior, crimson and rosy purple.
White Lady, crimson and white.

With Double Corollas—(25c. each, unless noted.)
Alpha, purple and crimson—30c.
Anna Bolyn, scarlet and violet rose.
Avalanche, violet-purple and light carmine.
Censor, scarlet and plum color.
Dolly Varden, red and purple.
E. G. Henderson, red and purple.
Elm City, crimson and purple.
Empress, crimson and white—30.
Garibaldi, dark violet, very double.
La Crinoline, plum color and crimson.
La Neige, white and carmine—30c.
Marshal McMahon, rose and purple.
Misai, coral-red and violet.
Mrs. H. Cannell, carmine and white--50c.
Narda Freros, red and white.
Princess of Wales, pink and white.
Purple Prince, red and purple.
Sir Colin Campbell, scarlet and dark purple.
Terpsichore, white--30c.
Virgile, new, (no description--50c.)

With Golden Foliage.
Avalanche—20c.
Anna Bolyn—20c.
Cloth of Gold—25c.
Golden Mantel—25c.
Meteor—25c.
Wave of Life—20c.

Winter Flowering—(20c. each.)
Corymbiflora, scarlet.
Coccinea Rosea, blush white and rose.
Fulgens, red and greenish tipped.
Lustre, waxy-white and vermillion.
Mrs. Marshall, blush white and rose lake.
Speciosa, blush and scarlet.
Syringiflora, rosy carmine.
Pracocœa.

Gardenia cameliaflora, white, very fragrant 75
" Florida, white, very fragrant 50

GERANIUMS.

New Double Varieties—(30c. each, unless noted.)
August Villaume, deep red, shaded orange.
Depute Laflize, vermillion purple.
Louis Witchuer.
Madame Edgar Quinet, pure white.
Madame Boucharlat aine, salmon-tinted, orange, striped white.
Madame Boucharlat, salmon, with reddish hue.
Madame Margotten.
Monsieur Buchler, bright mahogany color.
Meteor Flagg, splendid crimson, imbricated pips.
Pearl, new, choice white--$1.00. Single.
Prefet de Lyon, crimson-scarlet, large--50c.
Plutarch.
Renommee, clear apricot, shaded coppery rose.
Sophia Clapton, pure ivory white.
Souvenir de Castile, amaranth, toned violet:
The Ghost, finest ivory white.
Wonderful, brilliant orange scarlet—40.
Wilfred, pearly white.

Double Flowering Varieties--25 cents each.
Alba Plena, double white.
Aline Sisley, double white.
Asa Gray, bright salmon.
Camelliaflora, rose color.
C. H. Wagner, orange-scarlet.
Charles Lyall, apricot, white margin.
Delight, crimson.
Deuil de Strausburg, rich scarlet.
Emily Laxton, firey scarlet.
Emile Lemoine, dark chamois, spotted white.
Gen. Saussier, rich rosy red, violet shade.
Henri Beurier, orange salmon, edge white.
J. C. Rodbard, salmon red, veined purple.
La Duc de Suez, crimson.
Louis Buchuer, rosy peach, and white.
Madam Charles Martin, china rose, salmon tint
Madam Rudolph Able, rose.
Madam Lemoine, rose.
Merville de Loraine, rose color.
Sapier Pompier, scarlet.
Signet, crimson.

Terre Promice, poppy red.
Tom Ponce Cerice, cherry red.
Triomphe de Lorain, rose.
" de Souvenir, scarlet.
" de Beauty, scarlet.
Venus, white.
Victor Lemoine, scarlet.
Victor Hugo, flaming orange.
Villa de Nancy, deep carmine.
William Pfitzer, scarlet.

Single Flowering—20 cents each, unless noted.
Acme, salmon, white edge.
Alexandra, crimson.
Beauty of Kingsess, salmon, white eye and margin—30.
Bishop Simpson, salmon and pink—30.
Blue Bell, bluish pink.
Bouquet de Flora, pure white, cherry center.
Charm, scarlet, white eye.
Chieftain, orange scarlet.
Duchess, rosy lilac.
Flora Hill, clear pink.
Gen. Grant, brilliant scarlet.
George W. Earle, large white flower, rose center—30.
Haidee, magenta, shaded blue.
Jean Sisley, fine scarlet, large white eye.
Jealousy, (new) Indian red—50.
Lion Heart, rosy salmon.
Louis Veuillot, crimson-scarlet.
Lustre, scarlet.
Mad. Betty, pink and white striped--30.
Mad. Domage, scarlet.
Mad. Dureau, rose color.
Mad. Werle, salmon-rose, white margin.
Mad. Vaucher. pure white.
Md'lle Nillson, rose.
Master Christine, bright pink.
Mrs. Underwood, fine white.
Mrs. Quilter, pink.
Mrs. W. Whitely, orange scarlet, white eye.
Romulus, crimson.
Queen of the West, orange-scarlet.
Titian, salmon-scarlet.
The Moor, vermillion-crimson, upper petals shaded purple—30.
Violet Hill Nosegay, purple-salmon.
Vesuvius, bright scarlet.
White Clipper, pure white.
White Perfection, white.
White Tom Thumb, dear old white.

Golden Tri-color.
Lady Cullum—50.
Louisa Smith—30.
Mrs. Pollock—25.
Mrs. Jno. Clutton—75.
Plutarch—50.
Quadricolor—75.
Socrates—25.
Sophia Damaresque—25.
Sunset--35.
Ruby Ring—35.

Silver Tri-color.
Burning Bush--50.
Charming Bride—50.
Italia Unita—35.
Mrs. Mapping—1.00.

With Silver Edge Leaf.
Bijou--25.
Flower of the Day--20.
Lady Plymouth—40.
Mountain of Snow--25.
Silver Queen—15.

Golden and Bronze Zone.
Crystal Palace Gem—20.
Golden Fleece--20.
Happy Thought—30.
Queen of the Prairies—25.

Ivy-Leaf Geraniums—25 cents, unless noted.
Bridal Wreath.
Dr. Schomburgh.
Duke of Edinburgh.
Elegans.
" variegata.
Fairy Bells.
Floribunda.
Holly Wreath.
Kœnig Albert—1.00.

Princess Thyra.
Remarkable.
Willsii.
Willsii Rosea.

Cape or Sweet-Scented.
Apple Scented—50.
Balm—20.
Betula or Beach Leaf—25.
Dr. Livingstone or Pepper—20.
Lemon Scented—20.
Nutmeg Scented—20.
Oak Leaf or Querquefolia—25.
Peppermint Scented—25.
Pennyroyal Scented—20.
Shrubland Pet—20.

Gladiolus, all variet's mixed—10c. each, $1 per doz.

Goldfussia Anisophylla, fl. lilac, bell-shaped	$ 25
Gynerium Argentum, pampas grass	25
Habrothamnus Elegans, flowers rosy purple	25
" Magnifica, fl. light scarlet	25
Hedera (Ivies) Helix, English ivy	25
" " Hibernica, Irish ivy	25
" " Regneriana, Japan ivy	20
" " Russian ivy	20
Hedera Helix Marmorata, variegated, golden-yellow	50
" Hibernica Aurea Maculatis, bordered golden-yellow	50
" Marginata Argentea, variegated with white	50
" Japonica Versicolor, variegated white and pink	35
Heliotrope Anna Turrell, violet blue, white eye	30
" Cardinal Richelieu, lavender-blue	25
" Cherub, pure white	30
" Constance	25
" Distinction, very fragrant	20
" Duc de Lavendary, violet purple	25
" Gloire de Bordeaux, violet-blue, light center	25
" Guascoi, dark violet	30
" Juliette, violet	20
" Mad. de Blonay, almost white	20
" Reine des Violettes, rosy-violet, white center, yellow eye	30
" Souv. d'Urville, light violet	25
" Triomphe de Liege, pale lavender	30
Hemerocallis Fulva, Day Lily, yellow	15
" Flava (Lemon Lily) bright yellow	25
" Germanica, pale lemon	25
Heterocentrum Album, flowers white, star-shaped	25
" Roseum, flowers rose color	25
Hibiscus Carminatus Perfectus, carmine rose crimson center	50
" Cooperii Tri-color, flowers scarlet	50
" Conspicua, scarlet crimson	50
" Cruentus, rich crimson red	50
" Double Crimson, deep crimson	50
" " Orange, flowers orange,	50
" " Salmon, clear salmon	50
" Fulgidus, scarlet, single	35
" Grandiflora, crimson scarlet	50
" Kermesinus, carmine crimson	50
" Lutea, double yellow	50
" Miniatus, vermillion scarlet	50
" Metallicus, single crimson	25
" Rubra Plena, double crimson	50
" Single Red, red flowers	35
" " Rose, rose-colored	45
" Sinensis Variegata, flowers crimson	1.50
" Vivicans	1.00
Hoya Bella, small wax-like flowers	50
" Carnosa, flowers star-shaped, wax-like, pink	50c to 1.00
" " Variegata, variegated foliage	1.00
" Cunninghami, the Phillippian Island wax plant	1.00
Hydrangea Hortensis, flowers rose-color	25
" Paniculata, white	50
" Radiata,	25
" Rosea Alba, white and carmine	25
Imatophyllum Grandiflorum, plant of the agapanthus family	1.00
" Mineatum	1.00
Ivies American	20
" German	15
" Kenilworth	15
" Moneywort	15
Jasminum Grandiflorum (Catalonian Jessamine) flowers white	$ 25
" Officinale	25
" Revolutum, yellow, very fragrant	50
Justicia Alba, flowers white	25
" Discolor, flowers pink, large trusses.	25
" Cornea, flowers rosy-pink	25
" Purpurea, flowers purplish crimson	25
Lantana Alba Grandiflora, white	20
" " Perfecta, white	20
" Adolphus Avas, canary, dark center	20
" Brilliantissima, yellow and scarlet	20
" Comtesse de Mornay, blush, opening lemon	20
" Cobeille d'Or, pale lemon	20
" Don Calmet, lilac, orange center	20
" Fulgens Mutabilis, scarlet	20
" Grand Sultan, scarlet	20
" Gustave Fisher, rose and orange	20
" Harket's Perfection, foliage yellow and green	25
" Hutchinson, lemon yellow	20
" Imperatrice Eugenie, rose, opening yellow	20
" Lilacena	20
" Mine d'Or, scarlet, spotted foliage	20
" Monfee, crimson	20
" Mutabilis Major, dark orange	20
" Orange Yellow	20
" Princess Clotilda, pink, yel'w center	20
" Queen Victoria, fine white	20
Laurus (Viburnum) Tinus, flowers white	50
Libonia Penrhosiensis, flowers rich crimson	30
" Floribunda, flowers scarlet and yellow, during winter	25
Lonicera Aurea Reticulata, flowers white,	25
" Belgicum, red and yellow	25
" Hallicana, pure white, changing to yellow	25
" Sempervirens, deep red and yellowish	25
" Tartarica Rubra, rose color	25
Ledenbergia Rosea-Aenea, house shrub	35
Lopezia Rosea, flowers rose-color	25
" Mineata, flowers white	25
Lycopodium Cordifolium, creeping, mossy, feathery-like	50
" Hugelii, erect, plume-like	25
" Involvens, dwarf, feathery-like	25
" Lepidophylla, resurrect'n plant	50
" Wildenovia, tall, erect, fern-like	50
Madera or Mexican Vine	15
Mahernia Odorata, flowers yellow	25
Manettia Cordifolia, flowers bright scarlet	25
Mammillaria Gracilis	25
" Pusilla	25
" Stellata	25
" Sphœrica	25
" Shiediana	25
" Tenuis	25
Maurandia Barclayana, house vine	20
Medinilla Erythrophylla, choice house shrub	50
Mesembryanthemum Amabilis (Ice or Dew Plant) flowers yellow	15
" Barbatum, fl'wers pink	15
" Cordifolium (Dew Pl't)	15
flowers pink	15
" Variegatum	25
" Dolabraform	15
" Pinnifolia, fl's. scarlet	25
" " Alba, fl's white	25
Mikania Violacea, creeping vine, with variegated foliage	25
Mimulus Moschatus (Musk Plant from Oregon), fl'crs pale yel'w	25
Musa Cavendishii (Banana) flowers scarlet	6.00
" Paradisiaca, the true plantain tree, flowers pink	1.00
" Rosacea, flowers pink, fruit orange col'r	1.00
" Sapientum, the true banana, fruit yellow, flowers pink	1.00
" Zebrina, variegated foliage	3.00
Myrtus Communis, flowers white	50
Napalia Cochinillifera	50
Nierembergia Gracilis, white, purple and violet	15
Oleander Atro-Sanguinea, double, scarlet	50
" Double Purple	50
" " White	50
" Flavum Duplex, double yellow	50
" Giant des Battles, double scarlet	75

Oleander Gloriosum	$ 50
“ Henri Mares	50
“ “ Sahut	50
“ Lutea, light straw color	50
“ Madona Grandiflora, pure white	50
“ Paul Sahut	50
“ Prof. Durand, white and yellow	50
“ Rosea	50
“ Splendens, double pink	25
“ Such's New Double White	50
Olea Americana, the American Olive	50
“ Fragrans, delicious, fragrant white fl'rs	50
Opuntia alba spina	25
“ Arborescenes	25
“ Braziliensis	25
“ Ficus Indica	25
“ Microdasys	35
“ Missouriensis	25
“ Rafinesquii	25
“ Rufida	50
“ Vulgaris	25
Othonna Crassifolia, a pretty basket plant	25
Oxalis Alba, white	20
“ Bowieii, flowers pink	25
“ Ortgiesi, violet-purple foliage	25
“ Rosea, flowers roseate	25
“ Versicolor, white, crimson striped	25
“ Violacea, hardy, flowers violet purple, fine for borders	15
Palm, Brahea Filimentosa (Pritchardia Filifera)	2.00
“ Carludovica Palmata	1.00
“ Caryota Urens	50
“ Chamarops Excelso or Fortuni	50
“ “ Humalis	50
“ Curculigo Recurvata	30
“ “ Variegata	3.00
“ Phœnix Dactylifera (Date Palm)	50
“ Sabal Recurvata	50
Specimen plants of 15 varieties at special prices.	
Panicum Plicatum Vittatum	30
“ Variegatum	20
Passiflora Alba, flowers pure white	25
“ Colvilli, flower light blue	25
“ Decaisneana, blue, red and purple	25
“ Incarnata, purple. (hardy)	25
“ Trifasciata. variegated leaf	30
Pedilanthus Tithyroloides	30
Peperoma Arifolia	25
“ Marmorata	15
“ Maculosa	15
“ Magnoliafolia	25
“ Procumbens	15
“ Resedæflora	25
“ Velutina	15
Periploca Grœca, flowers purple	25
Peristrophe Angustifolium. Aurea Variegatum, mauve flowers	25
'etunia Alba Excelsior, clear white, double and fragrant	25
“ American Belle, mauve and crimson	25
“ Bermaid violet and white	25
“ Queen of the Valley, white and velvety crimson	25
“ Sovereign, rosy-purple, blotched with white	25
“ Snowball, pure white, very large and double	25
'hlox Decussata	25
“ Procumbens, an old variety	15
“ Subulata, moss pink	15
'hilodendron Pertusum	2.00
'hormium Tenax, New Zealand Flax	1.00
'hysianthus Albens, flowers white	25
'ilea Reptens, minute pink, star-shaped fl's.	15
“ Arborea	15
“ Muscosa	15
ilocereus Hookerii	65
iper Nigrum, black pepper vine	25
lumbago Capensis, flowers azure blue	50
“ Larpentæ, flowers indigo blue	25
“ Rosea, flowers rose-color	35
“ Zeylanica, flowers pure white, waxy	25
oinsetta Pulcherima	25
'olygonum Reflexum	15
“ Siebaldi	35
unica Granatum, flowers single, red	50
“ “ Alba pleno, double white	50
“ “ Rubra pleno, doub. red	50
“ “ James Vick	50
uya Altenstenii, tropical epiphytes	50
Rhodiola Rosea, hardy echeveria-like plant	$ 25
Rhyncospermum Jasminoides, choice climber	25
“ “ Variegata	50
Richardia Alba Maculata, variety of Calla	25
Rivina Braziliensis, fine for house culture	30
Rochea Falcata, white leaf, succulent	30

ROSES.

Hybrid Perpetuals, 50 cents each unless noted.

- Beauty of Waltham, rosy carmine.
- Belle of Normaudy, lavender, large, full and fine.
- Deuil de Prince Albert, dark crimson, large and fine.
- Duke of Wellington, brilliant crimson large, full, extra fine.
- Duplessis de Mornay, brilliant crimson.
- Firebrand (Wm. Paul) flowers dark maroon fiery red center—$1.00.
- Gen. Washington, brilliant rosy carmine approaching scarlet.
- Gen. Jacqueminot, brilliant scarlet-crimson, superb glowing color.
- Giant of Battles, brilliant crimson, large full, and very sweet.
- George Prince, dazzling red, shaded with rose.
- Jean Touvais, bright purplish-crimson.
- Jenny Perrick, light pink.
- Josine Hanet, purplish-red, very full and double.
- La France, satin-pink, outer petals pale flesh, perfectly hardy—75.
- La Reine, rosy-lilac, very large.
- Lady Emily Peele, white, slightly tinted crimson, very fine.
- Madam Charles Wood, brilliant red passing into lively rose—60.
- Mad. de Stella, bright rose, large, full and fine.
- Mad. Derreux de Douville, light satin-rose, shaded.
- Mad. Alfred de Rougemont, pure white, delicately shaded with rose.
- Mad. Hunnebelle, a beavtiful China rose color, shaded with carmine.
- Mad. Maria Finger, globular, double, carnation rose color—75.
- Olga Marix, white, tinged flesh color—1.00.
- Perle Blanches. white, slightly tinted with carmine—75.
- Pline, violet-red, velvety, large and double.
- Prince Eugene Beauharnais, brilliant reddish-scarlet, shaded purple.
- Souvenir de Charles Montault, vivid red, medium size.
- Souvenir de Lady Eardly, deep rosy-crimson, shaded scarlet.
- Souvenir de Wm. Wood, blackish maroon,
- Standard of Maringo, bright crimson.
- Triomphe de Versailles. light rose beautifully cupped.
- Vulcan, rich clouded crimson with scarlet

Bourbon Rose—40 cents each.

- Appoline, delicate pink.
- Enfant d'Ajaccio. flower double, cupped, fragrant, bright scarlet-crimson.
- Hermosa, pink, one of the finest.
- Henri Plantier, bright rose, large.
- Imperatrice Eugene, beautiful pale rose.
- Louis Odier, bright rose, full and free flowering.
- Marechal Villars, violet rose.
- Queen of the Bourbons, rich blush.
- Reine Victoria, soft rose. flowers medium size.
- Souvenir de Malmaison, beautiful, clear flesh color, edges blush.
- Verdiflora, or Green Rose, flowers green.

Bengal, China or Daily Roses.

- Agrippina, rich velvety crimson. superb.
- Abbie Moiland, dark rosy crimson, a desirable dark rose.
- Arch Duke Charles, rose, changing to crimson.
- Cels, bright red, constant bloomer. showy, quite hardy.
- Ducher, pure white, medium size, fine form, flowers very freely.
- Louis Phillippe, dark crimson, light center.
- La Phœnix, rich rose color.
- Mrs. Bosanquet, pale flesh, excellent.
- Purple Crown, rich dark crimson, very free bloomer.

Premium de Paris, crimson-purple, blooms freely.
Pink Daily, light pink, constant bloomer, a general favorite.
Sanguinea dark crimson, a free bloomer, good pot rose.
Vesuvius, dark velvety-crimson, free.
White Daily, creamy-white, fine, profuse bloomer.

Tea-Scented—35 cents each unless noted.
Arch Duchess Theresa, creamy-white yellow center.
Belle Lyonnaise, deep canary yellow, changing to white. tinted salmon.
Bon Silene, carmine, shaded orange.
Bougere, rosy-blush or lilac.
Catherine Mermet, flesh-colored rose, large,
Cels, flesh color.
Cheshunt Hybrid, cherry-carmine—1.00.
Coquette de Lyon, canary-yellow, medium size, good form—50c.
Cornelia Cook, creamy-white.
Countess La Bath, rosy-salmon, shaded amber, extra fine.
Devoniensis, pale yellow, very large, a superb old rose.
Duchess de Brabandt, rosy-blush, shaded-amber, ends of petals fringed.
Gen. Blanchard, white, tinted with flesh color.
Glory de Dijon, yellow, shaded flesh-color.
Homer, color rose, tipped with red, with a salmon center.
Isabella Sprunt, creamy-yellow, of fair form, fine for bouquets.
La Pactole, cream, center lemon yellow, large and full, free bloomer.
La Tulip, creamy white, tipped crimson—50c.
Levison Gower, rosy-salmon, large, fragrant.
Madam Bravy, creamy white, rose center, large, perfect shape.
Mad. Bremond, bright red, slightly tinged purple.
Mad. Celina Noirey, delicate shaded rose, backs of petals red.
Mad. de Narbonne, a free flowering variety, pale blush, fine, large.
Mad. Falcot, apricot yellow.
Mad. Ristori, rosy blush, very fine.
Mad. Villermoz, white, center salmon, large and full.
M'lle Rachel, white, extra fine, full bloomer.
Marquise de Foucault, creamy yellow, very double, fine.
Marechal Neil, beautiful deep yellow, very large, sweet scented—$1.00.
Maria Sisley, yellowish white, broadly margined rose.
Melville, deep rosy-blush.
Montplaisir, deep salmon yellow—50c.
Perfection de Montplaisir, canary yellow, medium size, full—75c.
Safrano, bright apricot, in bud, changing to buff, extra winter bloomer.
Sombruil, white, tinged with rose, very large and full.
Souvenir d'un Ami, salmon rose, shaded.
Triomphe de Luxemburg, coppery rose.
White Tea, pure white, very fragrant.

Noisette—25c. each unless noted.
Augusta, bright yellow, large and double, good winter bloomer,
Celine Forestier, deep canary-yellow, flowers good size.
Caroline Marniesse, white, with pink center, blooms in clusters.
James Sprunt, (Climbing Agrippina,) rich, dark crimson.
La Marque, white, tinged with lemon-yellow, fine pillar rose.
Ophire, buff, tinged red, distinct.
Phalœ, cream-white, shaded blush.
Reine de Massiss, a new Noisette Rose of 1875, fine salmon yellow.
Setina, dark pink, very desirable, free bloomer.
Solfaterre, beautiful sulphur yellow.
Washington, white, flowers freely in clusters till frost.
Woodland Margaret, pure white, free bloomer.

Moss Rose—50c. each, unless noted.
A Feuilles Pourpes, (A.) bright red, young leaves purplish, distinct—75c.
Alice Leroy, (A.) rosy lilac, large flowers.
Blanche, (Perpetual White Moss,) pure white, blooming in cluster —75c.
Capt. Ingram, (A.) purplish crimson, violet shade, full and fine.
Cristata, (Crested Moss,) (A.) rose color, with fine crested or fringed buds—$1.00.
Crimson, (Old English Moss,) light crimson, large, very mossy.
Deuil de Paul Fontaine, (Fontaine.) (P.) deep purple red, shaded very brilliantly with fiery-red—$1.00.
Duchess de Istra, (A.) light rose, free bloomer, fine.
Henry Martin, (A.) brilliant carmine.
Madame de la Rochelambert, (A.) amaranth, large and full.
Madame Moreau, (P.) rose, edged with white, deeper in the center—$1.00.
Madame Landeau (Moreau) (P.) fine clear red, touched and spotted with white—$1.00.
Muscosa Minor, (A.) deep rose, free bloomer.
Precocæ,(A.) deep pink, mottl'd, early bloom'r.
Princess Adelaide, (A.) pale, glossy, rosy-lilac, in very large corymbs.
Raphael, (P.) blush, flowering in corymbs, large and full—75c.
Salet, (P.) bright rosy red, a free bloomer.
William Lobb, (A.) velvety-crimson, shaded purple, strong grower.
White Moss, (A.) flower white, large, double.

Microphylla, or Red Burr Rose, blush or rose color, deep red center........................ 25
Microphylla, or White Burr Rose, creamy-white, sweet-scented 3
Microphylla, or Burr Rose, (Premier Essai,) flesh color, crimson center 5

Musk Rose.
Herbemont Musk Cluster, flower creamy-white, very fragrant 4
White Musk, very hardy climbing rose, pure white 40

Climbing Roses--40c. each, unless noted.
Baltimore Belle, blush, becoming white, immense clusters--50c.
Mrs. Hovey, blush white.
Prairie Gem, bright crims'n, bl'ch'd white-50c
Prairie Queen, deep rose, the strongest rose and most hardy.
Russell's Cottage, very rich, crimson shaded.

Hardy Garden Roses.
Madame Plantier, hardy and choice, pu white, fine for cemetery--35c.
Harrison's Yellow, the earliest to bloom spring--25c.
Napoleon Triumphant, white pillar rose.

French Rose, Œillet Parfait, pure white, strip with rosy crimson--40c.
Scotch Rose, William the Fourth, flowers whit often shaded red--25c.

Ruellia Maculata, spotted leaf........................ 5
Russellia Juncea, flowers crimson ....
" Floribunda ....
Saccharum Maddeni, pampas grass 5
Salvia Argentea, flowers white........................ 0
" Coccinea, flowers small, deep crimson 5
" Compacta Nana, small pink flowers.. 5
" Involucrata, flowers rose color........... 5
" Leucantha, light blue flow's, white tips 5
" Mrs. Stephens, deep crimson maroon...
" Purpurea, purple, foliage and stems 5 silver grey........................ 5
" Rosea, rose color... 5
" Splendens, bright scarlet ....
" " Variegata, scarlet, foliage 5 variegated........................
Salvia Splendens Soucheti Flora Alba, pure 0 white........................ 5
Salvia Verschaffeltii, rosy-red and white...... 0
Sanseviera Javanica 0
" Guineensis 0
" Zeylanica.. 5
Sanchezia Nobilis Variegata 5
" Spectabilis Variegata 0
Saxifraga Japonica........................ 5
" Sarmentosa ....

Sedum Carnea Variegatum	25
" Glaucum	25
" Hypnoides	15
" Japonicum	25
" Siebaldi	25
Sempervivum Arachnoideum, fl'rs rose color	25
" Aboreum, not hardy, golden yellow	25
Sempervivum Tabuliform, not hardy, yellow.	25
Senecio Macroglossus	25
" Pentasitus	25
" Scandens	15
Scindapsus Pictus	50
Silphium Laciniatum, (Compass Plant)	25
Smilax, Myrsiphyllum Asparagoides	50
Solanum Jasminoides	15
" " Variegata	30
" Pseudo Capsicum. (Jerusalem Cherry)	15
Sollya Heterophylla, blue	50
Statice Lanata, flowers pale lilac, hardy	25
Stevia Compacta, flowers pure white, in large tufts	25
Stevia Rosea, flowers with a tinge of rose	25
" Serratifolius, small white flowers	25
Stapelia Asterias, erect growing	50
" Deflexa, trailing	25
" Mixta, tall growing	35
" Normalis, trailing	25
" Serpentina, trailing	25
" Woodfordiana, trailing	25
" Grandiflora, erect growing	50
Torenia Asiatica, azure blue flowers, tipped with violet	25
Thunbergia Alata Alba, flowers white	50
Tradescantia Aquatica, suitable for hanging baskets	20

Tradescantia Discolor, flowers white	25
" Latifolia	15
" Repens, creeping variety	15
" " Vitata	25
" Zebrina	15
Tritonia Aurea, flowers orange-scarlet	25
Tritoma Uvaria, (Red Hot Poker)	50
Tuberose, Double flowering	15
" Pearl, dwarf	20
Urtica Microphylla, a choice lawn shrub	50
Vallota Purpurea, flowers brilliant scarlet	50
VINCA.—ERECT VARIETIES.	
Vinca Alba, flowers pure white	25
" Occulata, flowers pure white with pink eye	25
Vinca Rosea, (Madagascar Periwinkle), flowers star-shaped	25
VINCA.—TRAILING VARIETIES.	
Vinca Aurea Reticulata	20
" Major, flowers blue	15
" Minor, flowers blue	15
" " Alba, flowers pure white	20
" " Aurea Variegata	25
" Elegantissima, flowers large, blue	25
" Harrisonii, flowers light blue, star-shaped	25
Violet Maria Louise	25
" Neapolitan	15
" Victoria Reginæ	25
Wigandia Caracasana	50
Yucca Aloefolia, (Spanigh Dagger)	25 to 2.00
" Filamentosa	50
" Flaccida	1.00
" Gloriosa	50
" " Variegata	2.00
" Recurva	30

RECENT PUBLICATIONS.

During the past three months, new books, magazines and weekly papers, especially interesting to the Agriculturist, Horticulturist and Floriculturist, have been produced in increased abundance.

Among the number, we are especially pleased to see the long looked for Part First of *Ferns of North America*, by Prof. Daniel Eaton, (published by S. C. Cassino, Salem, Mass.—parts, $1.00 each,) and find our expectations fully realized. The number before us contains three large colored plates of *Ferns*, true to nature and of exquisite workmanship. It is a work of which every American should be proud.

With the new year our old friend, James Vick, commences his *New Illustrated Monthly Magazine*, (Rochester, N. Y., at $1.25 a year,) which will take the place of his old *Quarterly Floral Guide*. No. 1, vol. 1, which is now on our table, is full of interest to every one, as he deals so plain and sensible with all his subjects, which, by the way, are admirably chosen.

The good old *American Agriculturist*, (monthly—Orange Judd Company, New York city—$1.50 per annum,) always comes to hand *on time*, filled with the choicest productions of the day, and with something good for all.

No publication in America should receive a more hearty support than the *American Naturalist*, as its articles are from the pens of some of the best writers on Natural History in the country; and although some of the numbers may have very little of interest to the botanist, each volume when complete is indispensable to him in his studies. And the same may be said of the *Botanical Gazette*, (M. S. & J. M. Coultier, monthly, Hanover and Logansport, Ind., $1.00 a year,) for it is the only strictly scientific botanical magazine in the country, and in its pages are found much valuable matter nowhere else to be obtained.

The *Gardener's Monthly and Horticulturist*, (Philadelphia, Pa.—$2.10 per year,) still holds its place *pre-eminently* as a popular horticultural and floricultural magazine, and no one, with only a window in which to grow a few plants, can well do without it.

The *Ladies' Floral Cabinet*, (monthly—H. T. Williams, New York city, $1.50,) is, as its name indicates, a popular plant journal, especially adapted for the ladies.

The *American Garden*, (quarterly—Beach, Son & Co., New York city, 10c. a year,) is probably the cheapest, as it is one of the best, garden papers issued.

In the list of agricultural papers, we take pleasure in noticing—

The Country Gentleman; weekly, Albany, N. Y., $3.00 per year.
Farm and Fireside; semi-monthly, Springfield, Ohio, 50c. per year.
Rural New Yorker; weekly, New York city, $2.50 per year.
Scientific Farmer; monthly, Boston, Mass., $1.00 per year.
The Indiana Farmer; weekly, Indianapolis, Ind., $2.00 per year.
Pacific Rural Press; weekly, San Francisco, Cal., $4.00 per year. *Par excellent.*

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5	*Hot House Begonias.*	*For 1.00.*
5	*Varieties of Choice Tropical Ferns.*	*For 1.00.*
5	*Tropical Shrubs for the Lawn.*	*For 1.00.*
5	*Ornamental Grasses, including Pampas Grass.*	*For 1,00.*

10	*Varieties of Chrysanthemums*	*For One Dollar.*
10	*Varieties of Dahlias,*	*For One Dollar.*
10	*Plants in 5 Varieties Jasminum*	*For One Dollar.*
10	*Varieties of Winter-Flowering Plants*	*For One Dollar.*
10	*Varieties hardy Flowering Shrubs*	*For One Dollar.*
10	*Ever-blooming Roses*	*For One Dollar.*
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10	*Distinct Varieties of Cactus*	*For One Dollar.*
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10	*Choice (different varieties) hardy vines*	*For One Dollar.*
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10	*Choice varieties Cannas*	*For One Dollar.*
10	*Plants in 5 varieties, Bouvardias*	*For One Dollar.*

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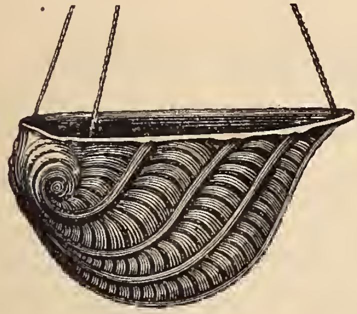

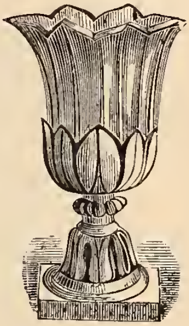

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	Per Doz.	Per 1,000.
2 inch Pots	$ 12	$5 85
2½ " "	15	6 90
Rose " (3 in. high, 2 in. wide,)	15	6 90
3 inch "	18	9 55
4 " "	25	13 25
5 " "	35	21 20
6 " "	50	31 80
7 " "	65	47 70
8 " "	80	58 30
10 " "	1 45	110 00
12 " "	3 00	265 00
4 inch Saucers	Per doz.	10
5 " "	" "	12
6 " "	" "	24
7 " "	" "	30
8 " "	" "	36
10 " "	" "	60
12 " "	" "	1 50

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Beaded	Per doz.	$2 15
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Rose	" "	2 15
Oak Leaf	" "	2 15
Shell	" "	1 65
Round	" "	1 10
Common	" "	65

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L. B. CASE'S

BOTANICAL INDEX

TO THE

New, Rare, and Beautiful Plants,

GROWN AND FOR SALE AT HIS COMMERCIAL GREENHOUSES,

RICHMOND, IND.

TORREY BOTANICAL
CLUB.
* NEW YORK. *

VOL. 1.—No. 5. APRIL, 1878. Published Quarterly, at 25 Cents a Year.

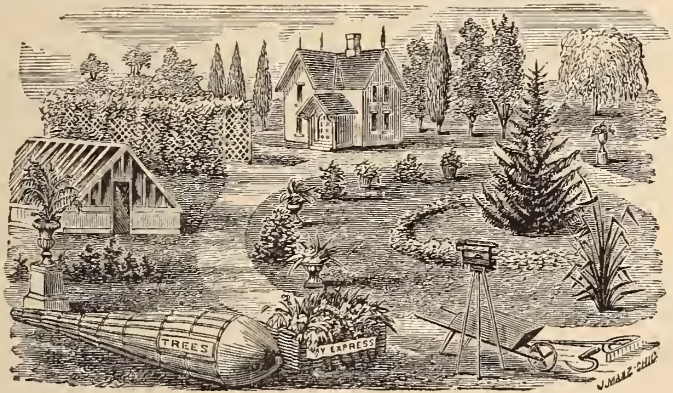

FIG. 33.

SPRING WORK.

SPRING has again returned, and with it we find urgent calls for work on all sides; so much so, that many things must be neglected or hastily done, which is always very unsatisfactory, especially to any one making improvements about a home. But business requires the first thoughts of the large majority of our people, and no matter whether it is the farm, shop, or store, its demands are imperative, and the work necessary to be done about the flower garden or lawn usually falls upon such inexperienced and unskilled help as can best be spared from more profitable work, which usually makes many improvements of a doubtful character. Recognizing this great fact, we would suggest to our readers that it is always desirable to know just what permanent improvements are to be made, and how we wish the place to appear when complete. To ascertain this, a detailed survey should be made of the place, and the plans discussed and perfected during evenings or leisure hours. Again, each year's work should accomplish something permanent in the way of at least one walk or drive, one flower bed or border, a few trees, shrubs or vines, so that next year the short time for spring work may be devoted to a continuation of the work already begun.

It is very essential to add each year one or more rare hardy trees or shrubs to the collection; or, what is equally as effective, put in practice the recommendations of the *Gardeners' Monthly*, for the past few years, and plant some of the hard-wooded vines, especially the *Wistaria*, by a post, and keep it cut back to six or eight feet; in a few years, on removing the post it will stand alone, making a tree which will bloom all summer. Pinch off all runners before they detract from the strength of the tree.

Plant all hardy trees, shrubs and vines early. Sow in a hot-bed seed of tender annuals, that they may bloom early in the season; but do not make flower beds until the ground is warm and ready for the seed, especially if it is clay ground.

HARDY TREES AND SHRUBS.

IT is always interesting to know what trees, shrubs and plants are hardy, in different localities,—especially to those who are anxious to secure such as are desirable to plant on their lawns and pleasure grounds,—for we all know that for many reasons some of our handsomest trees and shrubs are objectionable for lawn purposes; some are not sufficiently hardy to stand our severest winters, and often present a ragged appearance even after a moderate one; others are always infested with worms and insects, and are to be avoided; while still others emit a very disagreeable odor, often considered unhealthy or even poisonous, which unfits them for ornamental purposes. We are anxious to make the INDEX a medium for conveying reliable information on these subjects, especially in this section of the country, and hope all its friends will assist us in completing these lists as far as possible, which can only be done by recording the notes and observations of persons from a large scope of country; and although the observation of a single individual may seem to him insignificant, it is nevertheless valuable in making up the sum total of these interesting subjects. With this object in view, we have, with the assistance of our many kind horticultural friends, prepared a list* of trees and shrubs that are hardy here, at Richmond, Indiana, many of which are valuable for ornamental planting; and as our leading nurserymen can furnish any of the number desired, the list may be of service in making a selection. But while all have proved to be perfectly hardy here, a few would not flourish much further north on the same elevation—especially if not planted in a sheltered situation or protected from the sun during winter. The southern fruit trees named in the list —Apricot, Persimmon, etc.—usually produce bitter or insipid fruit, even if any fruit matures, which is very uncertain; but as they are all very showy, they are desirable for planting.

Another interesting feature in the study of the boundary of the vegetable kingdom, is the difference in the elevation of the different sections of the country above the level of the sea. This, in a mountainous region, is apparent even to the most casual observer; but in a country destitute of mountains, it is difficult to comprehend the gradual elevation that actually occurs in different portions of the country, and its effect on the flora. Let us now look at the tables of altitudes, and see what we can learn of our location. Commencing first at Cincinnati and journeying northwest, we find the Ohio river, at low water in front of Cincinnati, is 432 feet above the level of the ocean. (Cincinnati is given by Humphreys and Abbott as 498 feet high.) Earlham College, near Richmond, Ind., is 968 feet; Anderson, Ind., is 822 feet, and Logansport. Ind., is 562 feet,—according to the Geological Survey of Indiana, 1860. Now, in a direct line from east to west, we find Dayton, Ohio, is 475 feet above the level of the sea; the high land east and north of Richmond, but in its immediate vicinity, is over 1000 feet high; Indianapolis is 698 feet high; and the Wabash river, at Terre Haute, is 433 feet above tide-water. But Richmond is not the highest point of land in the State—it is only on a high elevation running from north-east to south-west. Some of the altitudes on this elevation are: Bellefontaine Depot, Ohio, 1167 feet above the ocean level; but a few miles east of Bellefontaine is the highest summit of land in this section of the country, reaching the height of 1540 feet above tide-water—according to the report of the Ohio Geological Survey. Union City, Ind., is 1230 feet; Richmond, Ind., 1000; Milton, Ind., 926; Greensburg, Ind., 913; then the land recedes rapidly until reaching the Ohio river at Lawrenceburg, Ind., where it is only 482, and Louisville, Ky., is about 441 ft. above tide-water.

Now let us in imagination visit some of the mountainous districts, and witness the effects of a few hundred feet of elevation on a mountain side. We shall find distinct zones or belts of vegetation running along the sides of the mountain, never varying in height in the same latitude; but as we change to the north or south, the belt of vegetation will be seen to be higher or lower, as we proceed to a colder or a warmer climate. Perhaps an article in *Harper's Monthly*, for September, 1877, (p. 522,) will illustrate the point better than any other description we can give; and as it is the narrative of an actual traveler, the whole article will repay reading. It says: "Nature has divided Mt. Shasta into three distinct botanical zones, the first (lowest) may be called the chapparal zone, and extends from 4,000 to 6,000 feet above the level of the sea; its breadth is about four miles, the characteristic botany is menzineta, cherry, chinquepin, ceanothus several species, golden rod, aster, gilias, lilies, lupine, and coniferous trees;

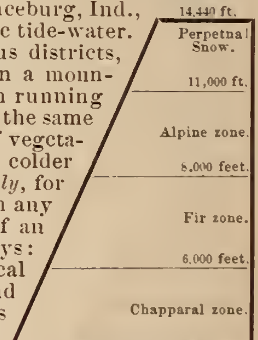

FIG. 34. *Vegetable Zones of Mt. Shasta, California.*

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*The original idea was to prepare a list of those just hardy here, but after a careful study of the subject, it was found impracticable.

ascending the first one in the order named, *Juniperus occidentalis* (lowest,) *Pinus tuberculata*, *Libocedrus decurrens*, *Abies Douglassii*, *Pinus Lambertiana*, *P. ponderosa var. Jeffreyii*, *Picea grandis*, *P. amabilis*, and *P. amabilis var. nobilis;* the last named only found in the upper portion of the belt. The next zone, or zone of the Silver Firs, is from 6,000 to 8,000 feet above the level of the sea; is from two to three miles broad, and is made up almost exclusively of three Silver Firs, *Picea grandis*, *P. amabilis*, and *P. amabilis var. nobilis;* (no plants are given in the list.) The upper zone of vegetation, the "Alpine zone," extends from 8,000 to 9,500 feet, for dwarf pines, *Pinus flexiles*, *P. monticola*, and *P. contorta*, and to 11,000 feet for a few dwarf plants, such as dwarf daisies, carices, (grass,) etc. The upper portion of the Alpine zone, extending to the line of perpetual snow, furnish a few characteristic plants, such as heathworths, stiff wiry carices, (grass,) kalmia, spirea, bryanthus, etc., while beyond the point of true vegetation are found lichens, mosses, and red snow, a peculiar form of minute *Algæ-Protococcus*, which are found in all high latitudes."

But space will not permit of a further discussion of this very interesting subject; suffice it to say, that our elevation is so much above the country east and west of us, that it will be found to be equivalent to a long distance of space at a lower level—for every 1000 feet of elevation is said to equal a degree of latitude, (about 69 miles); so we shall expect to find in the Miami valley to the east, and the Wabash valley to the west of us, a large portion of the flora that is barely hardy here, is perfectly hardy and vigorous a long distance north of us. And on the same latitude of Richmond, in these valleys, many a choice tree and shrub will flourish that will not survive a single winter here.

This list is very incomplete, and we would request our friends to make a note of anything omitted, and send us, that we may add to and eventually complete the list.

Amelanchier Canadensis, Service Berry.
Amorpha fruticosa, False Indigo.
Ampelopsis quinquefolia, Virginian Creeper.
Aralia spinosa, Hercules' Club.
Cephalanthus occidentalis, Button Bush.
Clematis virginica, Virgin's Bower.
Clematis viorna, Leather Flower.
Cornus asperifolia, Dogwood.
Cornus flacida.
Diospyros virginica, Persimmon.
Elæagnus argentea.
Euonymus Americana, Wahoo.
Euonymus atropurpurea.
Gymnocladus Canadensis, Coffee Nut.
Halesia tetraptera, Silver-bell Tree.
Hydrangea arborescens.
Hypericum prolificum.
Liquidambar styraciflua, Sweet Gum.
Magnolia accuminata, Cucumber Tree.
Magnolia umbrella, Umbrella Tree.
Menispermum Canadense, Moonseed.
Negundo aceroides, Box Elder.
Nyssa multiflora, Sour Gum.
Ostrya virginica.
Periploca græca, Silk Vine.
Pyrus coronaria.
Rhus typhina, Stag-horn Sumach.
Ribes aureum. Missouri Currant.
Staphylea trifolia, Bladder-nut.
Wistaria frutescens.

We have also prepared a list of hardy, introduced or cultivated trees, shrubs, etc., that are valuable for planting in this latitude, or even further north, where the elevation of the country is so much below this that the thermometer registers about the same amount of cold.

Ailantus glandulosus, Tree of Heaven.
Akebia quinata.
Ampelopsis tricuspidata, Japanese Ivy.
Amygdalis nana, Double White and Red Flowing Almond.
Amygdalus Persica fol. rub., Blood-leaved Peach.
Aristolochia sipho, Dutchman's Pipe-vine.
Aristolochia tomentosa.
Æsculus Hippocastanum, Horse Chestnut.
Azalea pontica.
Benzoin odoriferum, Spice Wood.
Buxus sempervirens.
Colycanthus floridus, Sweet Shrub.
Chionanthus virginica, Fringe Tree.
Corchorus Japonica
Cytisus laburnum, Golden Chain.
Darlingtonia brachyloba.
Deutzia crenata flore-pleno.
Deutzia gracilis.
Dirca palustris, Leatherwood.
Elæagnis hortensis, Bohemian Olive.
Euonymus radicans.
Forsythia viridissima, Golden Bell.
Hydrangea paniculata.
Jasminum nudiflorum.
Kolreuteria paniculata.
Ligustrum vulgare.
Ligustrum vulgare folis-aurea.
Magnolia conspicua.
Magnolia glauca.
Magnolia purpurea.
Magnolia trifollata.
Mahonia aquifolia.
Ostrya vulgaris. Hop Tree.
Passiflora incarnata.
Pæonia moutan, Tree Pæonia.
Plumbago Larpentæ.
Polygonum Sieboldi.
Prunus Armeniaca, Apricot.
Prunus suspensa.
Prunus virdidissima.
Rhus cotinus. Smoke Tree.
Robinia hispida, Rose Acacia.
Roses. in great number.
Rhododendron maximum. (hybrids.)
Salisburia adiantifolia, Maiden Hair Tree.
Salix Babylonica, Weeping Willow.
Spireas, in great variety.
Symphoricarpus occidentalis, Snowberry.
Symphoricarpus vulgaris, Purple-berry.
Tamarix Galica.
Vibernum opulus, Tree Cranberry.
Vibernum sterillis, Snowball.
Weigela rosea.
Weigela nana.
Weigela variegata.
Wistaria Chinensis.
Yucca fillimentosa.

The following list has been prepared during the past few years from plants, etc., that have lived in the open ground during one or more winters, unprotected; but we do not wish to be understood as advertising them as hardy, for they are not hardy, as a rule:

Diplopaypus chrysophillus.
Euonymus Japonicus.
Hydrangea Hortensis.
Hedera Helix.
Linaria Cymbalaria.
Magnolia grandiflora.
Mikania violacea.
Physianthus albens.

NATIVE FERNS AND MOSSES.

We take pleasure in presenting the following list of native *Ferns* and *Mosses*, collected by Mrs. MARY P. HAINES, from the vicinity of Richmond, Ind.; and as the study of the geographical distribution of plants is so very interesting to the botanist, we should be pleased to receive from collectors in other localities—north, south, east and west—similar lists for publication. We would say, the specimens from which this list was compiled were identified by some of the best scholars in *Cryptogamia* in the country, consequently no doubt can be entertained of their correctness. In addition to native *Ferns* and *Mosses*, Mrs. HAINES has one of the largest private collections of *Exotics* in the country, and takes great pleasure in adding choice specimens to it.

List of Musci, Hepaticæ, and Filices, collected in the vicinity of Richmond, Indiana, by Mrs. M. P. Haines.

MUSEI.

Aulocomnion heterostichon, Br. & Sch.
Anomodon rostratus, Sch.
Anomodon tristis.
Anomodon attenuatus, Hub.
Anomodon obtusifolius, Br. & Sch.
Atrichum angustatum, Hood.
Atrichum undulatum, Beauv.
Bartramia marchica, Brid.
Bartramia pomiformis, Hedw.
Barbula cæspitosa, Schw.
Barbula fallax, Hedw.
Barbula tortuosa, Web. & Mohr.
Barbula unguiculata, Hedw.
Bryum argenteum, Linn.
Bryum binsom, Schreb.
Bryum cæspiticium, Linn.
Bryum nutans, Schreb.
Bryum pyriforme, Hedw.
(Growing in Greenhouse.)
Bryum roseum, Dill.
Ceratodon purpureus, Hook. & Brid.
Climacium Americanum, Brid.
Cylindrothecium brevisetum.
Cylindrothecium cladorrhizans, Hedw.
Cylindrothecium seductrix, Hedw
Cylindrothecium seductrix var.
Dicranum flagellare, Hedw.
Dicranum scoparium, Hedw.
Dicranum viride, Hedw.
Drommondia clavellata, H. & T.
Fissidens adiantoides, Sull.
Fissidens minutulus, Sull.
Fissidens subbassilaris.
Fissidens taxifolius, Hedw.
Funaria hygrometrica, Hedw.
Funaria hygrometrica var. patula, Schw.
Grimmia Pennsylvanica, Schw.
Gymnostomum curvirostrum, Hedw.
Homalothecium subcapillatum.
Hypnum adnatum, Hedw.
Hypnum aduncum, Hedw.
Hypnum acuminatum, Beauv.
Hypnum boscii, Schw.
Hypnum curvifolium, Hedw.
Hypnum campestre, Br. & Sch.
Hypnum cylindricarpum, C. Mull.
Hypnum delicatulum, Linn.
Hypnum deplanatum.
Hypnum fluitans, Linn.
Hypnum gracile, Br. & Sch.
Hypnum gracile var. Lancastriense.
Hypnum hispidulum, Brid.
Hypnum hians, Hedw.
Hypnum imponens, Hedw.
Hypnum irriguum, Hood & Wils.
Hypnum laetum, Brid.
Hypnum minutulum, Hedw.
Hypnum riparium, Hedw.
Hypnum riparium var. cariosum.
Hypnum rutabulum, Linn.
Hypnum rivulare; Bruch.
Hypnum serrulatum, Hedw.
Hypnum serpens, Linn.
Hypnum serpens var. orthocladon, Beauv.
Hypnum serpens var. radicale, Brid.
Hypnum serpens var. brevipes.
Hypnum salebrosum, Hoff.
Hypnum strigosum, Hoff.
Hypnum varium.
Hypnum acuminatum var. tenue.
Hedwigia ciliata, Ehrh.
Leucobrynm vulgare.
Leskia denticulata, Sull.
Leskia polycarpa. Hedw.
Leptodon Ohioense.
Leptodon trichomitrion, Brid.
Leucodon brachypus, Brid.
Leucodon julaceus, Sull.
Mnium affine, Bland.
Mnium cuspidatum, Schreb.
Mnium orthorrhynchium.
Mnium rostratum. Schw.
Neckera pennata, Hedw.
Orthotrichum strangulatum Beauv.
Polytrichum formosum, Hedw.
Physcomitrion pyriforme, Brid.
Pylaisea denticulata.
Pylaisea intricata, Br., Eu.
Pylaisea velutina, Bryol, Eu.
Platygyrium repens, Bryol, Eu.
Schistidium apocarpum, Hedw.
Trichostomum pallidum, Hedw.
Thelia asprella, (Schrimp.) Hedw.
Thelia hirtella, (Hedw.) Sull.
Weissia viridula, Brid.

HEPATICÆ.

Astrella hemispherica, Beauv.
Aneura sessilis.
Blephoragia ciliaris, Nees.
Conocephalus conicus, Dum.
Chiloscyphus ascendens, (H. & W.) Sull.
Frullania æolitis, Nees.
Frullania eboracensis, Leh.
Frullania Virginica.
Frullania squarrosa.
Jungermannia curvifolia.
Jungermannia Schraderi, Merot.
Jungermannia scutata, Web.
Lophocolea bidentata.
Lophocolea heterophylla, Nees.
Lophocolea macouni.
Lophocolea minor.
Madotheca platyphylla, Dum.
Madotheca thuja, Dicks.
Marchantia polymorpha, Linn.
Radula complanata.
Sphagnoceotis communis.
Trichocolea tomentella.

FILICES.

Adiantum pedatum, L.
Aspidium acrostichoides, Swtz.
Aspidium spinulosum, Will.
Aspidium thelyptera. Sw.
Aspidium acrostichoides v. incisum.
Aspidium spinulosum v. dilatatum.
Asplenium thelypteroides, Mx.
Asplenium angustifolium, Mx.
Asplenium filix-foemina, Bernh.
Asplenium filix-fœmina v. Michauxi, Mett.
Botrychium Virginianum, Swz.
Cistopteris fragilis, Bernh.
Cistopteris bulbifera, Bernh.
Camptosorus rhizophyllus, Lk.
Onoclea sensibilis, L.
Polypodium hexagonopterum, Mx.
Pteris aquilina, L.

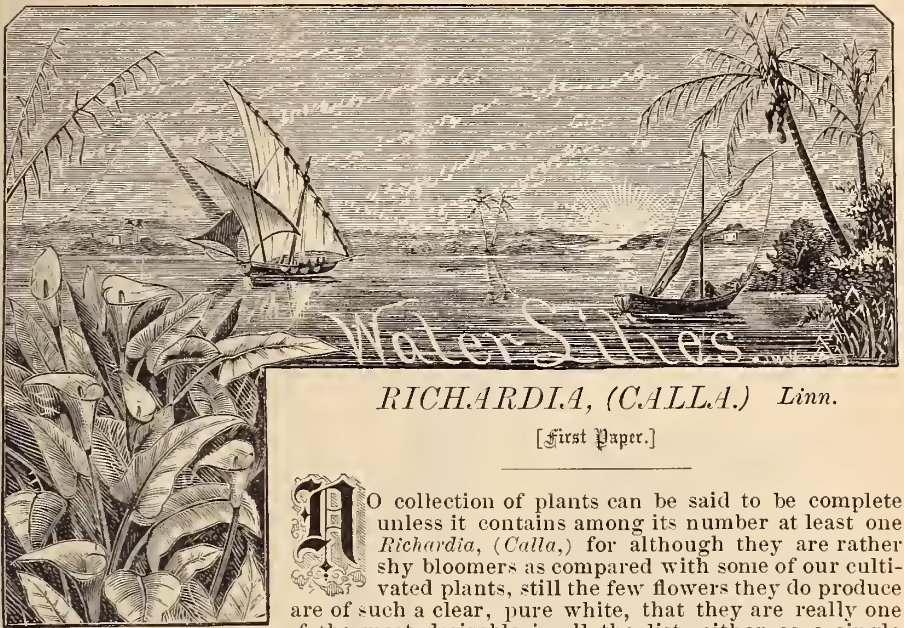
Water Lilies.

Fig. 35.

RICHARDIA, (CALLA.) Linn.

[First Paper.]

NO collection of plants can be said to be complete unless it contains among its number at least one *Richardia*, (*Calla*,) for although they are rather shy bloomers as compared with some of our cultivated plants, still the few flowers they do produce are of such a clear, pure white, that they are really one of the most desirable in all the list, either as a single specimen plant for the drawing-room, or to add to a collection of choice plants for the conservatory. They are probably justly considered *the most popular* house plant cultivated, and as they are such a common plant it will not require any description to introduce them to our readers. However, it is often beneficial to learn from the experience and observation of others what we may never have learned for ourselves, in regard to their treatment.

In order to obtain a clear and definite understanding of any subject, it must first be divested of all errors and misapplied names connected with it, and a talk about plants is often very unsatisfactory without making this point clear; consequently, it is sometimes necessary to give a seemingly uncalled for description of a very common plant, to designate the exact one we wish to refer to. And again, the continual subdivision of the old established *genera* of plants, tends to mystify the subject and render the confusion still more complete. This is particularly the case with the plants we now have under consideration, which Kunth has named *Richardia*, in honor of L. C. Richards, an eminent French botanist and traveler. The true *Calla* of Linnæus, of which there are four species, are not considered worth cultivating. One species, *Calla Palustris*, is a rather common plant in the swamps and bogs of Europe and America, and hardy as far north as 65° north latitude.

In the natural order of the vegetable kingdom, botanists have grouped together a very curious and distinct race of plants under the family *Araceæ*, of which *Arum Italicum*, Fig. 36, may be considered as a type. These *Arums* are really among our choicest, hardy, border bulbs, and should be more generally planted, as they require no attention after planting, except to keep the weeds down. Fig. 37 is a good representation of *Arum Dracunculus*, a perfectly hardy and very curious variety but rarely met with in cultivation. However, the time for planting the hardy bulbs is in September, and we will leave a further notice of the *Arums* until the fall number, (October,) when we shall endeavor to give a more detailed and definite history of this valuable and remarkable family of plants.

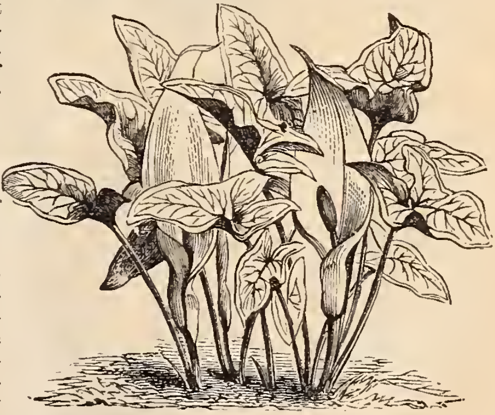

Fig. 36. *Arum Italicum.*

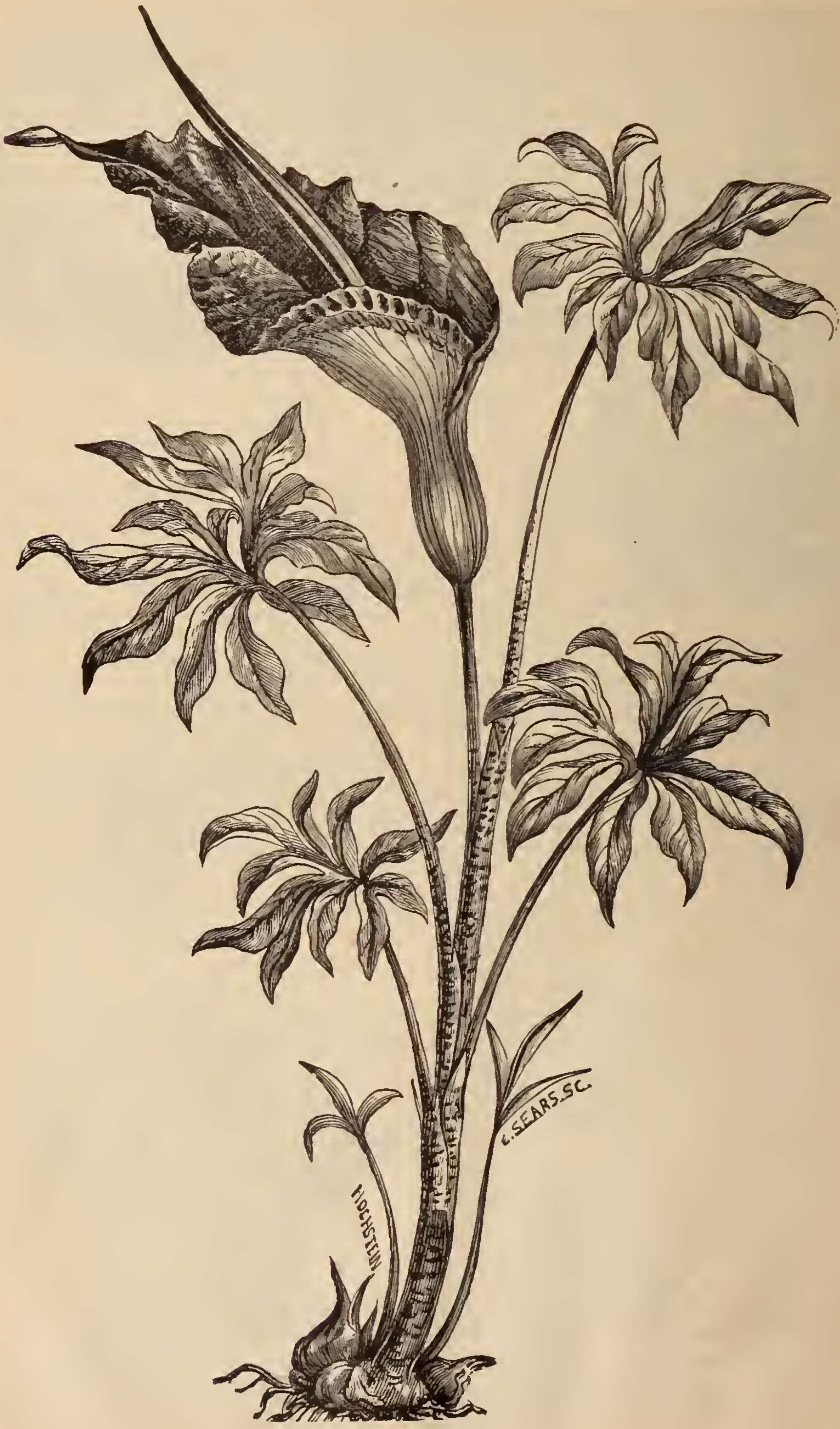
E. SEARS.SC.
HOCHSTEIN

FIG. 37. *Arum Dracunculus.*

FAMILY ARACEÆ.

Acorus, (Sweet Flag.) Linnæus.
Alocasia. Smith.
Amorphophallus. Blume.
Arisæma, (Indian Turnip.) Martius.
Arum, (type.) Linnæus.
Caladium. Ventenat.
Calla. Linnæus.
Colocasia. Linnæus.
Dieffenbachia. Schott.
Peltandra. Raf.
Philodendron. Lindley.
Pothos. Linnæus.
Richardia. Smith.
Symplocarpus, (Skunk Cabbage.) Salisbury.

Nearly all the species of this family delight in a damp situation, and while the most of them may be said to be true *Aquatics*, (Water Lilies,) a few species are found in rich, soft ground, that becomes perfectly dry during a portion of the year. They all flourish under cultivation, and adapt themselves to a dryer situation with remarkable success; not, however, attaining their natural vigor and beauty. But the *Richardia*, (*Calla*,) being the special object of interest in this article, we will now consider it more in detail.

There are but four species and two varieties of the *Richardia* known. They are—

Richardia Africana, Kunth. From the Cape of Good Hope.
Richardia Africana nana, (variety.)
Richardia alba maculata. From Africa.
Richardia hestata. From Natal.
Richardia hestata variegata, (variety.)
Richardia melanoleuca. From Africa.

The best known and most universally cultivated species is the so-called *Calla Æthiopica*, (*Richardia Africana*,) and for the present our description will apply more especially to this species. Although it is a native of the Cape of Good Hope, it has become thoroughly naturalized in the River Nile, and has received the very general appellation of "Lily of the Nile."

The flower-stem, starting from the apex of the tuberous root, is inclosed within the leaf-stem, which serves as a sheath for protecting the young and tender stalk and flower, and as it matures is terminated by a greenish-white so-called flower bud, (see Fig. 38, which represents a *Richardia* (*Calla*) as seen growing in a globe,) inclosing a fleshy, club-shaped spike, the flower-stem (spadix) and flowers. One of our commonest errors is in regard to the flowers of all the *Araceæ*. In our every day conversation we talk of the white flower of the *Calla*, the green or purple flower of the *Arum*, etc., meaning the hooded or rolled leaf (spathe) which serves as a floral envelop for the protection of the true flower-stalk while the flowers are as yet undeveloped.

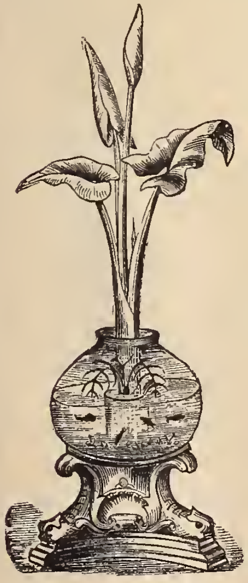

FIG. 38. *R. Africana.*

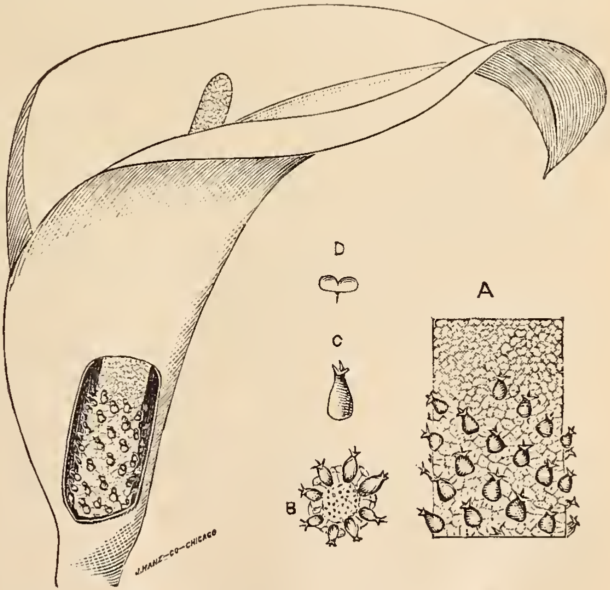

FIG. 39. *R. Africana—A, B, C and D, parts of the flower.*

The spathe upon maturity spreads out into a broad snow-white leaf, as seen in Fig. 39, which represents a *Richardia* (*Calla*) *Africana* flower, with a portion of the spathe at the base cut away, to show the position and form of the spadix. Fig. 39, *A*, is a section of the lower part of the spadix, enlarged to show the ovules and barren stamens in position. Fig. 39, *B*, is a horizontal section of the same, showing the form and position of the ovaries, and Fig. 39, *C*, one ovary enlarged. [The base of the ovary is more pointed than shown in cut, which was discovered too late to correct.]

The spadix is long, round, and completely covered with small, insignificant flowers, entirely destitute of calyx or corolla, but densely covered with the bright yellow anthers, (Fig. 39, *D*,) presenting to the eye an almost unbroken, fleshy stem. The anthers upon the upper portion of the spadix are wide, wedge-shape, connected between the cells, set close together in various fantastic forms, each cell emitting large quantities of snow-white pollen from the pores, (one in each cell.) The ovaries occupy the lower part of the spadix, and are mixed up with a number of barren stamens; each one has three *parietal placentæ*, and is partially subdivided into three compartments; the style is short and glandular. The fruit consist of one-celled few-seeded berries. The base of the spadix is inserted in a soft, cellular, enlarged process, which is the growing point of the flower stalk, and analogous to the succulent seed receptacle of the delicious fruit we call strawberry, raspberry, blackberry, etc.

The plant of *Richardia Africana* (*Calla*) is quite showy, producing large, arrow-shaped, glossy green leaves, standing well above the earth or water, producing their choice flowers under cultivation in midwinter or spring, but by varying their treatment they can be bloomed at almost any season of the year; however, mature plants seldom produce more than three or four flowers in a season, and one or two year old plants, as well as poorly grown plants, seldom throw up more than one flower stalk, and occasionally that one yields only a green, blasted spathe. They are probably the easiest cultivated and cared for of any house-plant, but the mode of treatment adopted by plant growers vary in so many important respects that it will be well to notice it here. Some will keep them growing in pots the year round; others plant them out in rich, moist ground, during summer; while still others will lay the plants (in the pot) on their side, in a shady place, and dry them out during summer. All the different modes of treatment have their enthusiastic advocates, and all are equally certain theirs is the best. We have tried all these different methods, and find the result the same. Now, while we are treating of the culture of the *Richardia*, let us notice an article in *Harper's Weekly*, for February 18, 1878. It says: "A lady of Michigan has been very successful in obtaining two flowers instead of one from every flowering sheath of the *Calla Lily*. Her method is as follows: As soon as the joint flower is cut, or begins to wither, pull the stalk down through the open sheath clear to the bottom. At the bottom will be found standing close to the stalk, another bud, inclosed in a delicate covering. Cut the old stalk away as close as possible without injuring the bud, and if it has not been kept back too long, it will grow up very quickly."

Now, our experience is that only large, well matured roots will throw up two flower stalks in quick succession, even when so treated, and then the second stalk will only start after the root has partly recovered from the exhaustion of the first flowering; consequently, we find the removal of the first flower stalk only accelerates the second blooming a short time. Fig. 40 represents a mature leaf stalk *C*, inclosing a portion of the mature stem of the first flower, *A*, and position of the second, dormant bud, *B*, as seen *in situ*. It is a well known fact to cultivators, that the ripening of fruit and the development of flowers on house-plants, so far exhaust the vitality of the tree or plant that it often requires a year or even more to recover entirely; especially if there was a large crop of fruit or inflorescence. It is a very common practice among successful fruit-growers and florists to remove a portion of the fruit, if a too large number of germs desire to mature, and to remove the flowers as soon as they are fully developed on pot plants. No doubt the removal of a withered flower (and stalk) is a benefit to the plant, and it certainly improves its appearance; but if we expect to increase its inflorescence, we must not be surprised if our anticipations are subjected to serious disappointment.

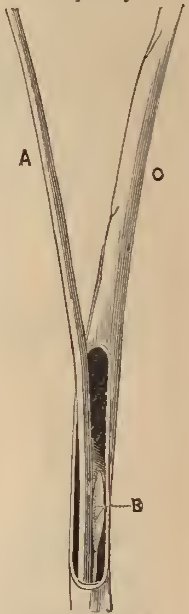

Fig. 40. *R. Af. Stalk.*

Richardia melanoleuca, from South Africa, is one of the most remarkably beautiful green-house plants ever introduced. It was discovered by one of William Bull's (London, England,) collectors, and sent out in 1876, but has never got to be a very common plant yet. It grows about two feet in height, throwing up from the tuberous root a small tuft of acuminate leaves with spreading basal lobes, the surface of which is dark green, with numerous oblong translucent spots following the direction of the veins; the spathe is three inches long and about the same in breadth when it is spread open, which it does to the very base, the color being a pale straw yellow with a large dark purple spot at the base; the spadix is short, with the upper or male portion of a bright orange yellow.

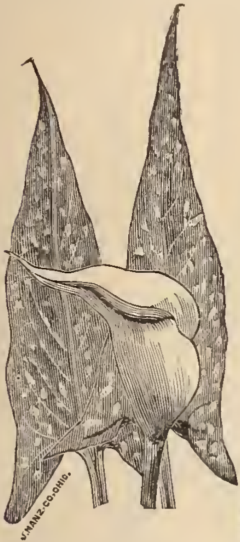
J. MANZ-CO-CHI.

FIG. 41. *R. alba maculata.*

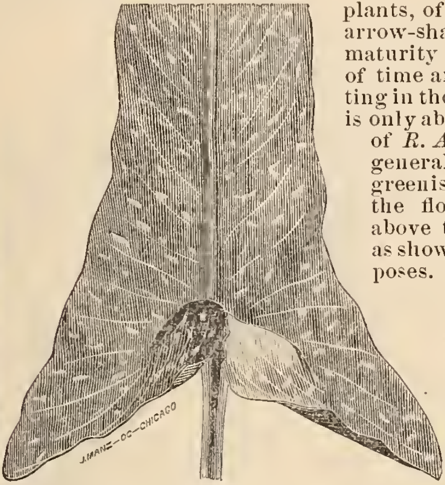

FIG. 42. *R. hestata variegata.*

Richardia alba maculata, (Fig. 41,) *Richardia hestata*, and their varieties, are bulbous rooted, perennial, herbaceous plants, of dwarf growth, with arrow-shaped leaves, attaining maturity in a very short space of time after planting or potting in the spring. The flower is only about one-third the size of *R. Africana*, of the same general form, and of a greenish-white color; but as the flower does not grow above the foliage, it is not as showy for decorative purposes. However, the leaves being dotted over the entire surface with small, snow-white spots, they are always attractive even when not in bloom. The specific difference between *R. alba maculata* and *R. hestata variegata* is perhaps too small for florists' use, as each one produces flowers of about the same size and color, has the same general form of growth, excepting *R. hestata* has more of a halbert-shaped leaf, and the hastate portion of the leaf is curiously wrinkled and folded into various fantastic shapes, giving it a crispy or bunchy appearance at the base. Fig. 42 is intended to illustrate this peculiarity, but it was almost impossible to bring out all the folds in a wood-cut as clear and distinct as desired; however, the idea is quite apparent.

By the middle of August all the species of *Richardia*, except *R. Africana*, will have ripened their foliage and must have a season of rest, when they must be laid away in a warm, dry place, either in the pot of earth in which they grew or in dry sand, until ready to start again. We start them usually in January, or at farthest by the end of February, by bringing them into a warm and light situation; giving them a moderate supply of water at first, increasing the amount as they come into foliage. The soil best suited to their wants when grown in pots is peat or leaf mold, with a liberal quantity of fine, sharp sand; but young bulbs will grow much larger and stronger if planted in the free ground. Indeed, old ones planted out after blooming will grow so much stronger, that they are more desirable for future use. They increase by scales or little bulbs forming at the side of old ones; but this method being too slow for commercial use, the propagator plants the bulb in the spring, in clean sand over heat, and in a short time the upper surface will present a number of *eyes*, or *sprouts*, and by cutting the bulb in pieces, so that each piece will contain an eye, a separate plant is formed. But if it is not separated, only the central one will usually grow; for this one being the strongest, will absorb the nourishment of the whole tuber.

WE have in preparation for the INDEX a series of illustrated papers on the so-called *Water Lilies*, particularly those found growing within the limits of the United States, and had selected the *Nelumbium*, (*Lotus*,) for this number, because it is comparatively so little known, and as it is such a curious plant. The engravings are nearly complete, and the text is already prepared, but for sufficient reasons we thought it best to delay its publication until the July number, when it will appear. We deem this explanation due our many friends who have contributed to its completion. As a substitute, we have chosen the *Richardia*, (*Calla*,) which is all the exotic or introduced species we propose to notice for some time.

NEW AND RARE PLANTS.

[We would request any one having new or strange Plants, to send us a notice for publication in these columns.]

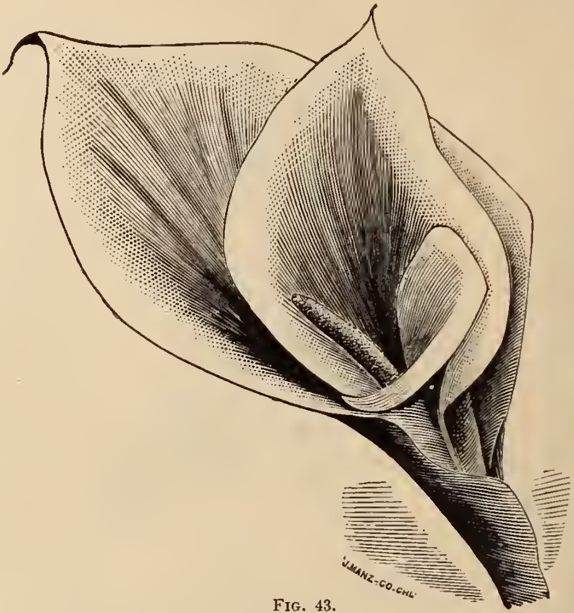
J.MANZ-CO.CHI.

FIG. 43.

RICHARDIA AFRICANA FLORE-PLENO.

(DOUBLE FLOWERING CALLA LILY.)

AT the head of this article we give a very perfect illustration of a strange development of *Richardia (Calla) Africana*, that may not be new to others, but it certainly is new to us, and we deem it worthy a notice in the INDEX. The plant was owned by Mrs. J. V. Woolsey, of Sandusky City, Ohio, who has flowered it for the past three years, during which time it had always produced flowers with single spathes; but this winter, upon perfecting its bloom, it was found to have two perfect spathes—one within the other; also, a third imperfect one, as shown in the illustration. The spathes were all pure white, but the center one was of the purest snowy white imaginable. Mrs. W. writes, it was long in arriving at maturity—first appearing about the 20th of December, but did not fully develop until about the 9th of January. It remained about three weeks (until January 30th) before it began to wither. It was photographed for the INDEX, February 9th, and the same uneven and withered appearance is still preserved in the illustration. In fact, the artist, Mr. McLean, has preserved its form with perfect accuracy.

If any of our friends have known of a similar development of the *Calla*, we would be pleased to hear from them.

NYMPHÆA FLAVA.

We have secured a small stock of the beautiful yellow water-lily, *Nymphæa Flava*, (*lutea*,) first figured by Audubon in his "Birds of America," but not known to botanists until Mrs. Mary Treat found it growing in the St. John's River, near Jacksonville, Florida, during the summer of 1876, and whose charming description is to be found in the August number of *Harper's Magazine*, 1877.

Plants, by mail, $1.00 each, or by express, 75 cents each.

AMARYLLIS TREATII.

This neat little bulb was discovered by Mrs. Mary Treat, in Florida, and has been named in honor of the discoverer. The flower is quite similar to *A. atamasco*, but of a much darker color, and blooms about two months later. It will be figured and described in Thomas Meehan's *North American Flowers*. Having secured some of the bulbs, we can furnish them at 25 cents each.

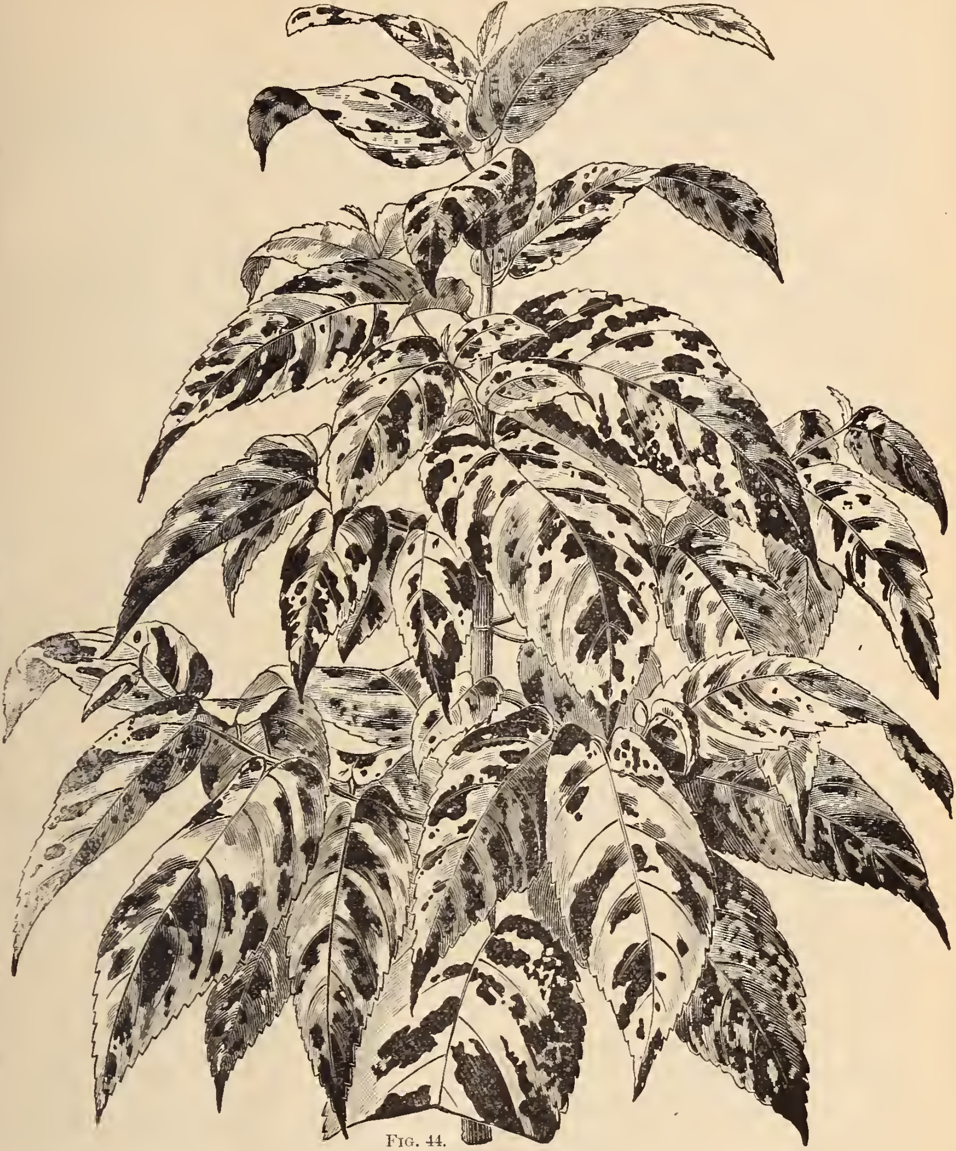

Fig. 44.

FICUS PARCELLII.

THIS is a very grand addition to our variegated stove plants, discovered by Mr. Parcell, the enterprising collector for Messrs. Baptist & Son, Australia, and sent out by Veitch & Sons, in 1874. It is thus described in the *Garden* for April 18, 1874: "This is one of the finest white variegated plants we have ever seen. Its leaves are as large as those of *Ficus elastica*, but are thinner in texture and coarsely serrated along the margins. They are bright green, irregularly blotched profusely with cream white and dark green." The plant is of free growth, maintaining its splendid variegation throughout, and is certainly one of the finest of all variegated decorative plants introduced of late years. It has excited the greatest admiration at all the recent exhibitions.

For the use of the cut of this truly royal plant we are indebted to the kindness of James Veitch & Sons, London. The above description is taken from their *New Plant Catalogue* for 1874.

Price of Plants, $1.50 each.

MISCELLANEOUS.

With the January number of the INDEX we distributed a circular offering plants for sale of *Nymphœa Flava*, from Florida, and crediting Mrs. P. T. W. Campbell with having re-discovered this rare plant, while we should have given Mrs. Mary Treat the honor of the discovery, and Mrs. Campbell the credit of the illustrations. We take pleasure in correcting the mistake, for no one prizes the valuable contributions from the pen of Mrs. Treat more than we do, and under no circumstances would we wish to detract a particle from her well earned laurels.

Mrs. J. M. Chase, of Kenosha, Wisconsin, has a plant of *Agave Americana*, (American Aloe, or Century Plant,) that is now throwing up a flower-stem, that promises to be the attraction of botanical interest in that section of the country for the summer of 1878. The plant is about twenty-five years old, and measures, from the extreme end of the central stalk to the top of the tub in which it grows, nine feet and three inches; it is six feet around the body, and has thirty-five enormous leaves, from eight to ten inches wide, from four to five inches thick at their attachment to the plant, and from seven to eight feet long.

RECENT PUBLICATIONS.

[We shall be pleased to receive from authors and publishers, copies of botanical books, papers, and prospectuses, for a notice in this column.]

Another quarter has passed, and with it new and choice additions have been made to our stock of horticultural and botanical reading. All the old established periodicals come to us well stored with information for spring work—the *Gardeners' Monthly* and *American Agriculturist* of course heading the list.

Among other valuable contributions to the fund of horticultural reading, we must not forget *Vick's Monthly Magazine; The American Garden*, (Beach, Son & Co., New York, quarterly); *The Ladies' Floral Cabinet*, (monthly, H. T. Williams, New York). aud a host of papers too numerous to mention, but all of great interest and ability.

In the scientific botanical department, we have *The Botanical Gazette*, in a new dress and increased pages, full, as usual, of information for the student, (monthly. M. S. & J. M. Coulter, Hanover and Logansport, Ind., $1.00); also, *The Bulletin of the Torry Botanical Club*, (New York, $1.00, monthly,) recording the investigations of some of our brightest scholars.

Floral California, No. 1, Vol. 1, comes to us well filled with choice reading from that land of plant and mineral wealth—California—and we speak for it a future prosperity worthy its choice name. The future numbers will be well illustrated, and when the proposed plans are carried into execution, it must be an almost indispensable magazine in the study of California botany. (Quarterly, 50 cts., Petaluma, Cal.)

Parts II and III of *Ferns of North America*, have been distributed, and still maintain their reputation of SUPERB. They are not only a valuable literary and scientific addition, but a choice book for the table. (Salem, Mass., $1.00 each.) Communicate with the publisher.

Ferns of Kentucky, by John Williamson, of Louisville, Ky. (Ready May 1st.) We have before us specimens of the illustrations (etchings) of which there will be forty, and must say they are very fine and true to nature. The work promises to be of great value and interest to the student of *Cryptogamia*, as well as to the plant fancier. Cloth binding, $2.00. Communicate directly with the author.

The Flora of the United States. No. 1, (Thomas Meehan, Philadelphia. Pa.,) will appear about June 1st, in the form of an illustrated popular history of the characteristic North American plants. All the species peculiar to the different geographical botanical centers in the United States will be described and illustrated in the succeeding numbers. Mr. M. would be pleased to receive seed or roots of characteristic plants from the different sections of the country. Correspondence solicited.

The Earlhamite, (monthly, Richmond, Ind., $1.00,) devoted to the interests of the Ionian (literary) Society of Earlham College, Richmond, always contains carefully prepared papers from the pens of some of our most thoughtful writers, and is well worth the subscription price, even if it does not contain any botany.

BOOKS WANTED.

Any person having a copy of any one of the following books to spare, will confer a favor by notifying us of the fact immediately, stating price and condition of the book:

Gray's Genera.
Plantæ Thurberi.
Plantæ Wrighti.
Wislizenus Report New Mex. Survey.

L. B. CASE'S

Retail Price-List of Plants.

Abelia rupestris	$ 50
Abutilon Boule de Niege	35
“ Darwinii	25
“ Mesopotamicum pictum	20
“ Thompsonii	25
“ Perle d'Or	30
Achænia malvaviscus	25
Achyranthus aurea reticulata	15
“ Borbonica	25
“ Caseii	20
“ Gilsonii	25
“ Lindenii	25
“ “ variegata	20
“ Verschaffeltii	25
Achillea rubra	15
“ Ptarmica	25
“ Tomentosa	15
Acorus graminus variegata	25
Adhatoda cydoniæfolia	50
Agapanthus umbellatus, (African Blue Lily)	50
Agave Americana	25
“ “ variegata	50
“ Applanata	1.00
“ Sislandi	50
“ Yuccafolia	1.00
Ageratum, Dwarf Imperial	15
“ Mexicanum	15
“ “ variegatum	20
Akebia quinata	25
Alamanda cathartica	30
Alocasia atropurpurea	50
“ Gibsonii, or Illustris	1.00
“ Javanicum	50
“ Jenningsii	1.00
“ Odorata	1.50
Aloe alba picta	30
“ Aspersa	50
“ Cooperii	1.00
“ Latifolia	1.00
“ Lingua	50
“ Margaritifera	50
“ Serratifolia	25
“ Soccatrina obliqua	30
“ “ umbellata	30
“ Variegata	75
“ Verrucosa	25
Aloysia citriodora, (Lemon Verbena)	20
Alternanthera amœna	10
“ Amabilis tricolor	10
“ Latifolia	10
“ Spathulata	10
“ Versicolor	10
Amaryllis alba	75
“ Atamasco	30
“ Formosissima	25
“ Johnsonii	50
“ Lutea	15
“ Prince of Orange	50
“ Regina	1.00
“ Rosea	75
Amorphophallus Rivierii	75
Anthurium magnificum	50
Aquilegia vulgaris, (Columbine), double and single white and purple	25
Aralia speciosa, (Hercules' Club.)	25
Arundo conspicua	50
“ Donax variegata	75
Aristolochia tomentosa, (Dutchman's Pipe)	50
Artemisia argentea	20
“ Blanch	20
“ Stellaris	25
Asclepias carassavica	25
Aspidistra lurida variegata	30
Astilbe Japonica	25
“ “ variegata	50
Balm, Gold and Silver variegated	10
Bambosa argentea	50
Bauana. [See Musa.]	
Basella rubra variegata	25
Begonia Aug. Sunderbruch	75
“ Argentea	25
Begonia argentea punctata	$ 25
“ “ hybrida	25
“ Carolinæfolia	50
“ Capensis	50
“ Dædalea	25
“ Elegans	35
‘ Eldorado	35
“ Emma	50
“ Emerald	35
“ Eximia	35
“ Feastii	50
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“ Frederick Seigmeyer	35
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“ Griffithii	25
“ Glaucophylla scandens	25
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“ Hydrocotylifolia	25
“ Heraclifolia nigricans	35
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“ Inimitable	35
“ Inspector Otto	25
“ Knerkii	75
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“ Lord Palmerston	25
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“ Madame Alwardt	35
“ Madame Perrier	30
“ Madame Revere	25
“ Madame Wagner	25
“ Manicata	25
“ Marshallii	35
“ Marmorata	35
“ Marginata	35
“ Matilda	25
“ Miranda	25
“ Miss Helen Buist	25
“ Mrs. Stewart Lowe	25
“ Nebulosa	35
“ Philadelphia	25
“ President Vanderheit	25
“ Prince Albert	25
“ Pruenosa	35
“ Queen Victoria	25
“ Queen of Hanover	40
“ Quadricolor	25
“ Rex	35
“ “ magnifica	25
“ Ricinifolia	50
“ “ maculata	25
“ “ nigricans	25
“ Rollinsonii	25
“ Rosedale	50
“ Reichenheimii	50
“ Smaragdina	75
“ Silver Queen	25
“ Silver Chain	40
“ Schœne Von Oberyenne	35
“ Subpeltata nigricans	30
“ Splendens	35
“ Tryphilla	25
“ The O'Donohue	35

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“ Fuchsioides	25
“ “ alba	25

Begonia Foliosa	$ 25
“ Hybrida multiflora	15
“ Incarnata	15
“ “ variegata	35
“ Incana	50
“ Nitida	25
“ Odorata	25
“ Oilifolia	15
“ Parvifolia	20
“ Palmata	25
“ Parnelli	75
“ Rosæflora	1.00
“ Richardsonii	25
“ Sanguinea	25
“ Saundersii	25
“ Semperflorens	25
“ Sedeni	30
“ Sutherlandii	30
“ Verschafeltii	25
“ Washingtonii	25
“ Weltonensis	25
“ Zebrina	20
Bocconia Japonica	25
Bohemeria argenta	35
Bouvardia Leantha—flowers dazzling scarlet	25
“ Hogarth—flowers rich scarlet	25
“ Triphilla—flowers rosy pink	25
“ Elegans—flowers scarlet carmine	25
“ Vreelandii—white flowers	35
“ Jasminoides—flowers white	35
Brugmansia Knightii	25
Cacalia articulata	25
“ Glauca	25
Calla Æthiopica. (Lily of the Nile)	50
“ “ Nana, (dwarf variety)	40
Caladium Albonervium	75
“ Alphonse Karr	75
“ Beethoven	1.00
“ Brogniartii	75
“ Duc de Ratibo	2.
“ Max Kolb	75
“ Pœcile	75
“ Sedenii	1.00
“ Wightii	75
Callistemon lanceolatum	50
“ Floribunda	50
Campylobotrys Ghiesbrectum	25
“ Refulgens	25
Canna Brenningsii	50
“ Discolor	25
“ Gigantea	25
“ Marechal Vailliant	25
“ Ne Plus Ultra	30
“ Nigricans	25
“ Pius IX.	25
“ Porleana	25
“ Promice de Nice.	25
“ Rubra superbissima	35
“ Spectabilis	20
“ Tricolor	50
“ Warczewiczii	25
“ “ rosea	25
“ Zebrina	25
“ “ nana	25
Carnation La Belle	35
“ La Purite	25
“ “ variegata	50
“ Mineata	25
“ President de Graw	25
“ Peter Henderson, (see New Plants)	50
“ Vailliante	25
Centaurea argentea	20
“ Candidisima	25
“ Gymnocarpa	25
“ Plumosa.	25
Centradena grandiflora—flowers pink	25
“ Rosea—flowers rose color	25
“ Floribunda	25
Cereus crenulatus	1.00
“ Cylindricus	50
“ Erisophorus	1.00
“ grandiflorus	30
“ Longissimus	30
“ McDonaldii	50
“ Monstrosa	25
“ “ formosa	40
“ Paucispinus	50
“ Repens	35
“ Serpentinus	25
“ Speciosa	30
“ Tortuosa	1.00
Cestrum auranticum—orange	$ 25
“ Laurifolium—white	25
“ Parqui—green	25

CHRYSANTHEMUMS.

Pompone—20c. each.

Bob—crimson red.
Eliza Strong—lemon, carmine tips.
La Fiance—white, serrated petals.
Lunail—white, purple tips.
M. Schmidt—bronze yellow.
Pink Perfection—soft pink.
Travenna—white.

Large Flowering—20c. each.

Emperor of India—fine white.
Jomina—purplish pink.
Josiah Wedgwood—rosy carmine.
Mrs. Brumless—red, yellow tips.

Japan or Fringed Varieties—25c. each.

Abd-el-Kadar—crimson maroon.
Admiranda—flesh color.
Cry Kong—sulphur, carmine tips.
Erecta superba—canary yellow.
Jane Salter—white, striped rosy lilac.
Kang Kang—bronzy yellow, lilac shade.
Laciniatum—pure white.

Cineraria Artemecioides	35
“ Candida	35
“ Centaurifolia	35
“ Compacta	35
“ Erecta	35
“ Maritima	25
“ Nana	35
“ Pendula	35
“ Success	35
“ Tomentosa	35
Cissus albo-nitens	15
“ Discolor	50
“ Lindenii	50
Clerodendron fragrans—flowers white	50
“ Bungeii—flowers pink	30
“ Belfori—climber	50
Cobæa scandens	40
“ “ variegated	50
Cocolobia platyclada	25
Columnea Schiedana	25
Colocasia (Caladium) esculentum	40
“ “ Bataviensis	40

Coleus—20c. each, unless noted.

Acis.
Admiral.
Ajax.
Albert Victor.
Autumn.
Aurea Marginata.
Beauty of Widmore.
Beauty of St. John's Wood.
Brilliant.
Blackamoor.
Charm.
Chameleon.
Crown Jewels.
Duke of Edinburg.
Eclipse.
Flora.
Glow-worm.
Golden Beauty
Golden Pheasant.
Grand Duke.
Hero.
Her Majesty.
Meteor.
Merrimac.
Miss Nightengale.
Nellie Grant.
Oriole.
Peerless.
Prince Leopold.
Prince Arthur.
Princess of Prussia.
Princess Royal.
Refulgens.
Richmond Beauty.
Setting Sun.
Scottii.
Surpasse Chameleon.50
Sultan.
Sunbeam.
Sylph.
South Park Beauty.
The Mandarin.
The Shah—40.
Verschaffeltii.
Velvet Mantle.
Zanzibar.

Corræa alba—flowers white	50
Convolvulus Mauritanicus	25
“ Palmatus	25
Conoclynum Xanthinum	25
Cotyledon arborescens	15
“ Orbiculata	25
“ Coruscans	15
Crassula arborescens—flowers roseate	25
“ Ciliata—flowers white	25
“ Gracilis	15
“ Lactea	15
Crape Myrtle—white	50
“ Red	25
Crinum Americanum	75

Cuphea hyssopifolia	$ 25
“ Danilissima	15
“ Platycentra	20
“ Eminens—winter flowering	20
Curculigo recurvata variegata	3.00
Cyperus alternifolius	15
“ “ variegatus	50
Deeringia Amhersti variegata	25
Dianella latifolia	25
Dielytra spectabilis—flowers crimson & white	15
Diosma fragrans	15
Dracæna Australis	35
“ Baptisti	2.50
“ Braziliensis	50
“ Chelsonii	2.50
“ Congesta	25
“ Cooperii	50
“ Draco (Dragon Tree)	2.00
“ Ferrea	1.00
“ Fragrans	50
“ Haageana	1.00
“ Indivisa	50
“ “ marginata	1.00
“ Odorata	50
“ Terminalis	30
Echeveria grandiflora	20
“ Metallica	50
“ Pulverulenta	50
“ Retusa floribunda	30
“ Rotundifolia	25
“ Sanguinea	15
“ Secunda	15
“ “ glauca	30
Echinocactus multiplex	25
“ Emesii	25
“ Emoryii	50
“ Ottonis	35
Eranthemum aspersum	50
“ Elegans	30
“ Pulchellum	25
“ Tuberculatum	35
Erythrina Crista-Galli	75
“ Caffra	1.00
“ Herbacea	75
“ Versicolor	1.00
Eucharis Amazonica (Amazon White Lily)	75
Epiphyllum Ackermanii	25
“ Phyllanthoides	25
“ Truncatum crenatum	25
“ “ violaceum	25
Euonymus Japonicus	10
“ “ Argenteus	25
“ “ Aurea variegata	50
“ “ Aurea marginata	30
“ “ Ovata	50
“ “ Tricolor	75
“ Radicans variegata	25
Eupatorium arboreum	25
“ Angustifolium	25
“ Elegans	25
“ Riparium	25
Euphorbia Brionii	25
“ Jacquiniflora	50
“ Pendula	20
“ Spinosa	30
“ Splendens	25
Farfugium grande	35
“ Ligatum variegatum	35
Feverfew Double White	15
“ Golden	15
“ Prince Alfred	15

FERNS FOR THE HOUSE, (TENDER.)

Acrostichium Alcicorne	1.00
Adiantum (Maiden Hair) Affines	25
“ “ Capillus veneris	25
“ “ Callopodes	25
“ “ Cuneatum	25
“ “ Concinum	25
“ “ Decorum	25
“ “ Farleyense	5.00
“ “ Formosum	25
“ “ Kuhneatum	25
“ “ Macrophyllum	1.00
“ “ Pedatum	25
“ “ Pubescens	25
“ “ Recurvatum	25
“ “ Tinctum	25
Aspidium Felix-Mass-Cristata	25
“ Molle	25
“ Strigulosum	25
Asplenium Belangerii	$ 50
“ Ebeneum	25
“ Fabianum	50
“ Ruta-mararia	35
“ Trichomanes	25
Blechnum glandulosum	25
Camptosorus rhizophyllus	25
Cheilanthus Californicum	50
Cystopteris obtusa	30
Davillia polyantha	40
Doodia blechnoides	50
Lygodium scandens	50
Microlepsis scabra	25
Nephrodium exaltatum	50
“ , Molle	25
Onychium Lucidum	40
Phlebodium aureum	50
Platyloma cordata	50
Polypodium Billardi	25
“ Pustulatum	25
“ Peltidium	25
“ Vulgare	25
Polystichum falestum	40
Pteris adiantifolium	50
“ Argyra	1 00
“ Cretica albo lineata	50
“ Gigantea	1.50
“ Grandulosum	40
“ Longifolium	25
“ Palmata	50
“ Semi-pinnate	25
“ Serrulata	15
“ “ cristata	25
“ Tremula	40
“ Tricolor	1.00
“ Umbrosa	50
Scolopendrium crispum	25
“ Fissum	50
“ Vulgare	25

In addition to the above lists of tender Ferns, we can furnish about one dozen varieties of hardy Ferns at prices ranging from 10c. to 25c. each.

Ficus Australis	75
“ Carica (Fig)	30
“ Elastica	75
“ Japonicus	25
“ Macrophylla	1.00
“ Nitida	50
“ Parcellii	1.50
“ Repens	25
Fittonia Argyroneaura	20
“ Gigantea	20
“ Marginata	20
“ Pearcei	20
“ Verschaffeltii	20
Fragaria Indica	20

FUCHSIAS.

With Single Corollas—(20c. each, unless noted.)

Annie, white and rose colored.
Arabella Improved, white and rose.
Aurea Superba, salmon and scarlet.
Bernice, red and purple.
Bianca Marginata, rose and flesh color.
Carl Halt, rose and white, striped.
Cherub, white and soft rose.
Clapton Hero, scarlet and crimson.
Coccinea Rosea, blush white and rose.
Corymbifolia, scarlet
Criterion, coral red and blue.
Day Dream, scarlet and violet blue.
Diadem de Flora, white and pink.
England's Glory, white and rose.
Fulgens, scarlet.
Gracilis Floribunda, scarlet and plum.
Jolly, white and carmine.
Karl Kahl, red and brown.
Little Alice, scarlet and white--30c.
“ Harry, scarlet and mauve blue—30c.
Lustre, coral-red and orange.
Microphylla, scarlet and purple.
Mrs. Marshall, blush white and rose lake.
Pracocœa.
Prince Imperial, dark purple and scarlet.
Procumbens, orange yellow.
Queen of Hanover, white and rose.
Racemosa, orange scarlet--$1.00.
Reine Blanch, white and salmon rose.
Rose of Castile, white and violet rose.

Schiller, white and crimson purple.
Speciosa, blush and scarlet.
Striata perfecta, white and carmine, striped.
Turban, plum color and white.
Vanquer de Pueblo, deep pink.
Wave of Life, scarlet and violet blue.
Warrior, crimson and rosy purple.
White Lady, crimson and white.

With Double Corollas—(25c. each, unless noted.)
Alpha, purple and crimson—30c.
Anna Bolyn, scarlet and violet rose.
Avalanche, violet-purple and light carmine.
Censor, scarlet and plum color.
Dolly Varden, red and purple.
E. G. Henderson, red and purple.
Elm City, crimson and purple.
Empress, crimson and white—30.
Garibaldi, dark violet, very double.
La Crinoline, plum color and crimson.
La Neige, white and carmine—30c.
Marshal McMahon, rose and purple.
Misai, coral-red and violet.
Mrs. H. Cannell, carmine and white--50c.
Narda Freros, red and white.
Princess of Wales, pink and white.
Purple Prince, red and purple.
Sir Colin Campbell, scarlet and dark purple.
Terpsichore, white--30c.
Virgile, new, (no description--50c.)

With Golden Foliage.
Avalanche—20c. Golden Mantel—25c.
Anna Bolyn—20c. Meteor—25c.
Cloth of Gold—25c. Wave of Life—20c.

Winter Flowering—(20c. each.)
Corymbiflora, scarlet.
Coccinea Rosea, blush white and rose.
Fulgens, red and greenish tipped.
Lustre, waxy-white and vermillion.
Mrs. Marshall, blush white and rose lake.
Speciosa, blush and scarlet.
Syringiflora, rosy carmine.
Pracocœa.

Gardenia cameliaflora, white, very fragrant 75
" Florida, white, very fragrant 50

GERANIUMS.

New Double Varieties—(30c. each, unless noted.)
August Villaume, deep red, shaded orange.
Depute Laflize, vermillion purple.
Louis Witchner.
Madame Edgar Quinet, pure white.
Madame Boucharlat aine, salmon-tinted, orange, striped white.
Madame Boucharlat, salmon, with reddish hue.
Madame Margotteu.
Monsieur Buchler, bright mahogany color.
Meteor Flagg, splendid crimson, imbricated pips.
Pearl, new, choice white--$1.00. Single.
Prefet de Lyon, crimson-scarlet, large--50c.
Plutarch.
Renommee, clear apricot, shaded coppery rose.
Sophia Clapton, pure ivory white.
Souvenir de Castile, amaranth, toned violet.
The Ghost, finest ivory white.
Wonderful, brilliant orange scarlet—40.
Wilfred, pearly white.

Double Flowering Varieties--25 cents each.
Alba Plena, double white.
Aline Sisley, double white.
Asa Gray, bright salmon.
Camelliaflora, rose color.
C. H. Wagner, orange-scarlet.
Charles Lyall, apricot, white margin.
Delight, crimson.
Deuil de Strausburg, rich scarlet.
Emily Laxton, firey scarlet.
Emile Lemoine, dark chamois, spotted white.
Gen. Saussier, rich rosy red, violet shade.
Henri Beurier, orange salmon, edge white.
J. C. Rodbard, salmon red, veined purple.
La Duc de Suez, crimson.
Louis Buchner, rosy peach, and white.
Madam Charles Martin, china rose, salmon tint
Madam Rudolph Able, rose.
Madam Lemoine, rose.
Merville de Loraine, rose color.
Sapier Pompier, scarlet.
Signet, crimson.
Terre Promice, poppy red.
Tom Ponce Cerice, cherry red.
Triomphe de Lorain, rose.
" de Souvenir, scarlet.
" de Beauly, scarlet.
Venus, white.
Victor Lemoine, scarlet.
Victor Hugo, flaming orange.
Villa de Nancy, deep carmine.
William Pfitzer, scarlet.

Single Flowering—20 cents each, unless noted.
Acme, salmon, white edge.
Alexandra, crimson.
Beauty of Kingsess, salmon, white eye and margin—30.
Bishop Simpson, salmon and pink—30.
Blue Bell, bluish pink.
Bouquet de Flora, pure white, cherry center.
Charm, scarlet, white eye.
Chieftain, orange scarlet.
Duchess, rosy lilac.
Flora Hill, clear pink.
Gen. Grant, brilliant scarlet.
George W. Earle, large white flower, rose center—30.
Haidee, magenta, shaded blue.
Jean Sisley, fine scarlet, large white eye.
Jealousy, (new) Indian red—50.
Lion Heart, rosy salmon
Louis Veuillot, crimson-scarlet.
Lustre, scarlet.
Mad. Betty, pink and white striped--30.
Mad. Domage, scarlet.
Mad. Dureau, rose color.
Mad. Werle, salmon-rose, white margin.
Mad. Vaucher, pure white.
Md'lle Nillson, rose.
Master Christine, bright pink.
Mrs. Underwood, fine white.
Mrs. Quilter, pink.
Mrs. W. Whitely, orange scarlet, white eye.
Romulus, crimson.
Queen of the West, orange-scarlet.
Titian, salmon-scarlet.
The Moor, vermillion-crimson, upper petals shaded purple—30.
Violet Hill Nosegay, purple-salmon.
Vesuvius, bright scarlet.
White Clipper, pure white.
White Perfection, white.
White Tom Thumb, dear old white.

Golden Tri-color.
Lady Cullum—50.
Louisa Smith—30.
Mrs. Pollock—25.
Mrs. Jno. Clutton—75.
Plutarch—50.
Quadricolor—75.
Socrates—25.
Sophia Damaresque—25.
Sunset--35.
Ruby Ring—35.

Silver Tri-color.
Burning Bush--50.
Charming Bride—50.
Italia Unita—35.
Mrs. Mapping—1.00.

With Silver Edge Leaf.
Bijou--25.
Flower of the Day—20.
Lady Plymouth—40.
Mountain of Snow—25.
Silver Queen—15.

Golden and Bronze Zone.
Crystal Palace Gem—20.
Golden Fleece—20.
Happy Thought—30.
Queen of the Prairies—25.

Ivy-Leaf Geraniums—25 cents, unless noted.
Bridal Wreath.
Dr. Schomburgh.
Duke of Edinburgh.
Elegans.
" variegata.
Fairy Bells.
Floribunda.
Holly Wreath.
Kœnig Albert—1.00.

Princess Thyra.
Remarkable.
Willsii.
Willsii Rosea.

Cape or Sweet-Scented.
Apple Scented—50.
Balm—20.
Betula or Beach Leaf—25.
Dr. Livingstone or Pepper—20.
Lemon Scented—20.
Nutmeg Scented—20.
Oak Leaf or Querquefolia—25.
Peppermint Scented—25.
Pennyroyal Scented—20.
Shrubland Pet—20.

Gladiolus, all variet's mixed—10c. each, $1 per doz.

Goldfussia Anisophylla, fl. lilac, bell-shaped	$ 25
Gynerium Argentum, pampas grass	25
Habrothamnus Elegans, flowers rosy purple	25
" Magnifica, fl. light scarlet	25
Hedera (Ivies) Helix, English ivy	25
" " Hibernica, Irish ivy	25
" " Regneriana, Japan ivy	20
" " Russian ivy	20
Hedera Helix Marmorata, variegated, golden-yellow	50
" Hibernica Aurea Maculatis, bordered golden-yellow	50
" Marginata Argentea, variegated with white	50
" Japonica Versicolor, variegated white and pink	35
Heliotrope Anna Turrell, violet blue, white eye	30
" Cardinal Richelieu, lavender-blue	25
" Cherub, pure white	30
" Constance	25
" Distinction, very fragrant	20
" Duc de Lavendary, violet purple	25
" Gloire de Bordeaux, violet-blue, light center	25
" Guascoi, dark violet	30
" Juliette, violet	20
" Mad. de Blonay, almost white	20
" Reine des Violettes, rosy-violet, white center, yellow eye	30
" Souv. d'Urville, light violet	25
" Triomphe de Liege, pale lavender	30
Hemerocallis Fulva, Day Lily, yellow	15
" Flava (Lemon Lily) bright yellow	25
" Germanica, pale lemon	25
Heterocentrum Album, flowers white, star-shaped	25
" Roseum, flowers rose color	25
Hibiscus Carminatus Perfectus, carmine rose crimson center	50
" Cooperii Tri-color, flowers scarlet	50
" Conspicua, scarlet crimson	50
" Cruentus, rich crimson red	50
" Double Crimson, deep crimson	50
" " Orange, flowers orange,	50
" " Salmon, clear salmon	50
" Fulgidus, scarlet, single	35
" Grandiflora, crimson scarlet	50
" Kermesinus, carmine crimson	50
" Lutea, double yellow	50
" Miniatus, vermillion scarlet	50
" Metallicus, single crimson	25
" Rubra Plena, double crimson	50
" Single Red, red flowers	35
" " Rose, rose-colored	45
" Sinensis Variegata, flowers crimson	1.50
" Vivicans	1.00
Hoya Bella, small wax-like flowers	50
" Carnosa, flowers star-shaped, wax-like, pink	50c to 1.00
" " Variegata, variegated foliage	1.00
" Cunninghami, the Phillippian Island wax plant	1.00
Hydrangea Hortensis, flowers rose-color	25
" Paniculata, white	50
" Radiata,	25
" Rosea Alba, white and carmine	25
Imatophyllum Grandiflorum, plant of the agapanthus family	1.00
" Mineatum	1.00
Ivies American	20
" German	15
" Kenilworth	15
" Moneywort	15

Jasminum Grandiflorum (Catalonian Jessamine) flowers white	$ 25
" Officinale	25
" Revolutum, yellow, very fragrant	50
Justicia Alba, flowers white	25
" Discolor, flowers pink, large trusses.	25
" Cornea, flowers rosy-pink	25
" Purpurea, flowers purplish crimson	25
Lantana Alba Grandiflora, white	20
" " Perfecta, white	20
" Adolphus Avas, canary, dark center	20
" Brilliantissima, yellow and scarlet	20
" Comtesse de Mornay, blush, opening lemon	20
" Cobeille d'Or, pale lemon	20
" Don Calmet, lilac, orange center	20
" Fulgens Mutabilis, scarlet	20
" Grand Sultan, scarlet	20
" Gustave Fisher, rose and orange	20
" Harket's Perfection, foliage yellow and green	25
" Hutchinson, lemon yellow	20
" Imperatrice Eugene, rose, opening yellow	20
" Lilacena	20
" Mine d'Or, scarlet, spotted foliage	20
" Monfee, crimson	20
" Mutabilis Major, dark orange	20
" Orange Yellow	20
" Princess Clotilda, pink, yel'w center	20
" Queen Victoria, fine white	20
Laurus (Viburnum) Tinus, flowers white	50
Libonia Penrhosiensis, flowers rich crimson	30
" Floribunda, flowers scarlet and yellow, during winter	25
Lonicera Aurea Reticulata, flowers white,	25
" Belgicum, red and yellow	25
" Hallieana, pure white, changing to yellow	25
" Sempervirens, deep red and yellowish	25
" Tartarica Rubra, rose color	25
Ledenbergia Rosea-Aenea, house shrub	35
Lopezia Rosea, flowers rose-color	25
" Mineata, flowers white	25
Lycopodium Cordifolium, creeping, mossy, feathery-like	50
" Hugelii, erect, plume-like	25
" Involvens, dwarf, feathery-like	25
" Lepidophylla, resurrect'n plant	50
" Wildenovia, tall, erect, fern-like	50
Madera or Mexican Vine	15
Mahernia Odorata, flowers yellow	25
Manettia Cordifolia, flowers bright scarlet	25
Mammillaria Gracilis	25
" Pusilla	25
" Stellata	25
" Sphœrica	25
" Shiediana	25
" Tennis	25
Maurandia Barclayana, house vine	20
Medinilla Erythrophylla, choice house shrub	50
Mesembryanthemum Amabilis (Ice or Dew Plant) flowers yellow	15
" Barbatum, fl'wers pink	15
" Cordifolium (Dew Pl't)	15
flowers pink	15
" Variegatum	25
" Dolabraform	15
" Pinnifolia, fl's. scarlet	25
" " Alba, fl's white	25
Mikania Violacea, creeping vine, with variegated foliage	25
Mimulus Moschatus (Musk Plant from Oregon), fl'ers pale yel'w	25
Musa Cavendishii (Banana) flowers scarlet	6.00
" Paradisiaca, the true plantain tree, flowers pink	1.00
" Rosacea, flowers pink, fruit orange col'r	1.00
" Sapientum, the true banana, fruit yellow, flowers pink	1.00
" Zebrina, variegated foliage	3.00
Myrtus Communis, flowers white	50
Napalia Cochinilliffera	50
Nierembergia Gracilis, white, purple and violet	15
Oleander Atro-Sanguinea, double, scarlet	50
" Double Purple	50
" " White	50
" Flavum Duplex, double yellow	50
" Giant des Battles, double scarlet	75

Oleander Gloriosum	$ 50
" Heuri Mares	50
" " Sahut	50
" Lutea, light straw color	50
" Madona Graudiflora, pure white	50
" Paul Sahut.	50
" Prof. Durand, white and yellow	50
" Rosea	50
" Splendens, double pink	25
" Such's New Double White	50
Olea Americana, the American Olive	50
" Fragraus, delicious, fragrant white fl'rs	50
Opuutia alba spina	25
" Arborescenes	25
" Braziliensis	25
" Ficus Indica	25
" Microdasys	35
" Missourieusis	25
" Rafinesquii	25
" Rufida	50
" Vulgaris	25
Othonna Crassifolia, a pretty basket plant	25
Oxalis Alba, white	20
" Bowieii, flowers pink	25
" Ortgiesi, violet-purple foliage	25
" Rosea, flowers roseate	25
" Versicolor, white, crimson striped	25
" Violacea, hardy, flowers violet purple, fine for borders	15
Palm, Brahea Filimeutosa (Pritchardia Filifera)	2.00
" Carludovica Palmata	1.00
" Caryota Urens	50
" Chamarops Excelso or Fortuni	50
" " Humalis	50
" Curculigo Recurvata	30
" " Variegata	3.00
" Phœnix Dactylifera (Date Palm)	50
" Sabal Recurvata	50
Specimen plants of 15 varieties at special prices.	
Pauicum Plicatum Vittatum	30
" Variegatum	20
Passiflora Alba, flowers pure white	25
" Colvilli, flower light blue	25
" Decaisneana, blue, red and purple	25
" Incaruata, purple. (hardy)	25
" Trifasciata, variegated leaf	30
Pedilanthus Tithyroloides	30
Peperoma Arifolia	25
" Marmorata	15
" Maculosa	15
" Magnoliafolia	25
" Procumbens	15
" Resedæflora	25
" Velutina	15
Periploca Grœca, flowers purple	25
Peristrophe Angustifolium, Aurea Variegatum, mauve flowers	25
Petunia Alba Excelsior, clear white, double and fragrant	25
" American Belle, mauve and crimson	25
" Bermaid violet and white	25
" Queen of the Valley, white and velvety crimson	25
" Sovereign, rosy-purple, blotched with white	25
" Snowball, pure white, very large and double	25
Phlox Decussata	25
" Procumbens, an old variety	15
" Subulata, moss pink	15
Philodeudron Pertusum	2.00
Phormium Tenax, New Zealand Flax	1.00
Physianthus Albens, flowers white	25
Pilea Reptens, minute pink, star-shaped fl's.	15
" Arborea	15
" Muscosa	15
Pilocereus Hookerii	65
Piper Nigrum, black pepper vine	25
Plumbago Capensis. flowers azure blue	50
" Larpentæ, flowers indigo blue	25
" Rosea, flowers rose-color	35
" Zeylanica, flowers pure white, waxy	25
Poinsetta Pulcherima	25
Polygonum Reflexum	15
" Siebaldi	35
Punica Granatum, flowers single, red	50
" " Alba pleno, double white	50
" " Rubra pleno, doub. red	50
" " James Vick	50
Puya Altenstenii, tropical epiphytes	50

Rhodiola Rosea, hardy echeveria-like plant	$ 25
Rhyncospermum Jasminoides, choice climber	25
" " Variegata	50
Richardia Alba Maculata, variety of Calla	25
Rivina Braziliensis, fine for house culture	30
Rochea Falcata, white leaf, succulent	30

Roses.

Hybrid Perpetuals, 50 cents each unless noted.

Beauty of Waltham, rosy carmine.
Belle of Normandy, lavender, large, full and fine.
Deuil de Prince Albert, dark crimson, large and fine.
Duke of Wellington, brilliant crimson large, full, extra fine.
Duplessis de Mornay, brilliant crimson.
Firebrand (Wm. Paul) flowers dark maroon fiery red center—$1.00.
Gen. Washington, brilliant rosy carmine approaching scarlet.
Gen. Jacquiminot, brilliant scarlet-crimson, superb glowing color.
Giant of Battles, brilliant crimson, large full, and very sweet.
George Prince, dazzling red, shaded with rose.
Jean Touvais, bright purplish-crimson.
Jenny Perrick, light pink.
Josine Hanet, purplish-red, very full and double.
La France, satin-pink. outer petals pale flesh, perfectly hardy—75.
La Reine, rosy-lilac, very large.
Lady Emily Peele, white, slightly tinted crimson, very fine.
Madam Charles Wood, brilliant red passing into lively rose—60.
Mad. de Stella, bright rose, large, full and fine.
Mad. Derreux de Douville, light satin-rose, shaded.
Mad. Alfred de Rougemont, pure white, delicately shaded with rose.
Mad. Hunnebelle, a beautiful China rose color, shaded with carmine.
Mad. Maria Finger, globular, double, carnation rose color—75.
Olga Marix, white, tinged flesh color—1.00.
Perle Blanches. white, slightly tinted with carmine—75.
Pline, violet red, velvety, large and double.
Prince Eugene Beauharnais, brilliant reddish-scarlet, shaded purple.
Souvenir de Charles Montault, vivid red, medium size.
Souvenir de Lady Eardly, deep rosy-crimson, shaded scarlet.
Souvenir de Wm. Wood, blackish maroon,
Standard of Maringo, bright crimson.
Triomphe de Versailles. light rose beautifully cupped.
Vulcan, rich clouded crimson with scarlet

Bourbon Rose—40 cents each.

Appoline, delicate pink.
Enfant d'Ajaccio. flower double, cupped, fragrant, bright scarlet-crimson.
Hermosa, pink, one of the finest.
Henri Plantier, bright rose, large.
Imperatrice Eugene, beautiful pale rose.
Louis Odier, bright rose, full and free flowering.
Marechal Villars, violet rose.
Queen of the Bourbons, rich blush.
Reine Victoria, soft rose. flowers medium size.
Souvenir de Malmaison, beautiful, clear flesh color, edges blush.
Verdiflora, or Green Rose, flowers green.

Bengal, China or Daily Roses.

Agrippina, rich velvety crimson. superb.
Abbie Moilard, dark rosy crimson, a desirable dark rose.
Arch Duke Charles, rose, changing to crimson.
Cels, bright red, constant bloomer. showy, quite hardy.
Ducher, pure white, medium size, fine form, flowers very freely.
Louis Phillippe, dark crimson, light center.
La Phœnix, rich rose color.
Mrs. Bosanquet, pale flesh, excellent.
Purple Crown, rich dark crimson, very free bloomer.

Premium de Paris, crimson-purple, blooms freely.
Pink Daily, light pink, constant bloomer, a general favorite.
Sanguinea dark crimson, a free bloomer, good pot rose.
Vesuvius, dark velvety-crimson, free.
White Daily, creamy-white, fine, profuse bloomer.

Tea-Scented—35 cents each unless noted.
Arch Duchess Theresa, creamy-white yellow center.
Belle Lyonnaise, deep canary yellow, changing to white. tinted salmon.
Bon Silene, carmine, shaded orange.
Bougere, rosy-blush or lilac.
Catherine Mermet, flesh-colored rose, large,
Cels, flesh color.
Cheshunt Hybrid, cherry-carmine—1.00.
Coquette de Lyon, canary-yellow, medium size, good form—50c.
Cornelia Cook, creamy-white.
Countess La Bath, rosy-salmon, shaded amber, extra fine.
Devoniensis, pale yellow, very large, a superb old rose.
Duchess de Brabandt, rosy-blush, shaded-amber, ends of petals fringed.
Gen. Blanchard, white, tinted with flesh color.
Glory de Dijon, yellow, shaded flesh-color.
Homer, color rose, tipped with red, with a salmon center.
Isabella Sprunt, creamy-yellow, of fair form, fine for bouquets.
La Pactole, cream, center lemon yellow, large and full, free bloomer.
La Tulip, creamy white, tipped crimson—50c.
Levison Gower, rosy-salmon, large, fragrant.
Madam Bravy, creamy white, rose center, large, perfect shape.
Mad. Bremond, bright red, slightly tinged purple.
Mad. Celina Noirey, delicate shaded rose, backs of petals red.
Mad. de Narbonne, a free flowering variety, pale blush, fine, large.
Mad. Falcot, apricot yellow.
Mad. Ristori, rosy blush, very fine.
Mad. Villermoz, white, center salmon, large and full.
M'lle Rachel, white, extra fine, full bloomer.
Marquise de Foucault, creamy yellow, very double, fine.
Marechal Neil, beautiful deep yellow, very large, sweet scented—$1.00.
Maria Sisley, yellowish white, broadly margined rose.
Melville, deep rosy-blush.
Montplaisir, deep salmon yellow—50c.
Perfection de Montplaisir, canary yellow, medium size, full—75c.
Safrano, bright apricot, in bud, changing to buff, extra winter bloomer.
Sombrnil, white, tinged with rose, very large and full.
Souvenir d'un Ami, salmon rose, shaded.
Triomphe de Luxemburg, coppery rose.
White Tea, pure white, very fragrant.

Noisette—25c. each unless noted.
Augusta, bright yellow, large and double, good winter bloomer,
Celine Forestier, deep canary-yellow, flowers good size.
Caroline Marniesse, white, with pink center, blooms in clusters.
James Sprunt, (Climbing Agrippina,) rich, dark crimson.
La Marque, white, tinged with lemon-yellow, fine pillar rose.
Ophire, buff, tinged red, distinct.
Phalœ, cream-white, shaded blush.
Reine de Massiss, a new Noisette Rose of 1875, fine salmon yellow.
Setina, dark pink. very desirable, free bloomer.
Solfaterre, beautiful sulphur yellow.
Washington, white, flowers freely in clusters till frost.
Woodland Margaret, pure white, free bloomer.

Moss Rose—50c. each, unless noted.
A Feuilles Pourpes, (A.) bright red, young leaves purplish, distinct—75c.
Alice Leroy, (A.) rosy lilac, large flowers.
Blanche, (Perpetual White Moss,) pure white, blooming in cluster —75c.
Capt. Ingram, (A.) purplish crimson, violet shade, full and fine.
Cristata, (Crested Moss,) (A.) rose color, with fine crested or fringed buds—$1.00.
Crimson, (Old English Moss,) light crimson, large, very mossy.
Deuil de Paul Foutaine, (Fontaine,) (P.) deep purple red, shaded very brilliantly with fiery-red—$1.00.
Duchess de Istra, (A.) light rose, free bloomer, fine.
Henry Martin. (A.) brilliant carmine.
Madame de la Rochelambert, (A.) amaranth, large and full.
Madame Moreau. (P.) rose, edged with white, deeper in the center—$1.00.
Madame Landeau (Moreau) (P.) fine clear red, touched and spotted with white--$1.00.
Muscosa Minor, (A.) deep rose, free bloomer.
Precocæ,(A.) deep pink, mottl'd, early bloom'r.
Princess Adelaide, (A.) pale, glossy, rosy-lilac, in very large corymbs.
Raphael, (P.) blush, flowering in corymbs, large and full—75c.
Salet, (P.) bright rosy red, a free bloomer.
William Lobb, (A.) velvety-crimson, shaded purple, strong grower.
White Moss, (A.) flower white, large, double.

Microphylla, or Red Burr Rose, blush or rose color, deep red center	25
Microphylla, or White Burr Rose, creamy-white, sweet-scented	30
Microphylla, or Burr Rose, (Premier Essai,) flesh color, crimson center	50

MUSK ROSE.

Herbemont Musk Cluster, flower creamy-white, very fragrant	40
White Musk, very hardy climbing rose, pure white	40

CLIMBING ROSES--40c. each. unless noted.
Baltimore Belle, blush, becoming white, immense clusters--50c.
Mrs. Hovey, blush white.
Prairie Gem, bright crims'n, bl'ch'd white-50c.
Prairie Queen, deep rose, the strongest rose and most hardy.
Russell's Cottage, very rich, crimson shaded.

HARDY GARDEN ROSES.
Madame Plantier, hardy and choice, pure white. fine for cemetery--35c.
Harrison's Yellow, the earliest to bloom in spring--25c.
Napoleon Triumphant, white pillar rose.

French Rose, Œillet Parfait. pure white, striped with rosy crimson--40c.
Scotch Rose, William the Fourth, flowers white, often shaded red--25c.

Ruella Maculata, spotted leaf	20
Russellia Juncea, flowers crimson	25
" Floribunda	40
Saccharum Maddeni, pampas grass	25
Salvia Argentea, flowers white	25
" Coccinea, flowers small, deep crimson	20
" Compacta Nana, small pink flowers	15
" Involucrata, flowers rose color	25
" Leucantha, light blue flow's, white tips	25
" Mrs. Stephens, deep crimson maroon	25
" Purpurea, purple, foliage and stems silver grey	25
" Rosea, rose color	15
" Splendens, bright scarlet	25
" " Variegata, scarlet, foliage variegated	35
Salvia Splendens Soucheti Flora Alba, pure white	20
Salvia Verschaffeltii, rosy-red and white	25
Sanseviera Javanica	50
" Guineen-is	2.00
" Zeylanica	2.00
Sanchezia Nobilis Variegata	25
" Spectabilis Variegata	25
Saxifraga Japonica	20
" Sarmentosa	15

Sedum Carnea Variegatum	25
" Glaucum	25
" Hypnoides	15
" Japonicum	25
" Siebaldi	25
Sempervivum Arachnoideum, fl'rs rose color	25
" Aboreum, not hardy, golden yellow	25
Sempervivum Tabuliform, not hardy, yellow.	25
Senecio Macroglossus	25
" Pentasitus	25
" Scandens	15
Scindapsus Pictus	50
Silphium Laciniatum, (Compass Plant)	25
Smilax, Myrsiphyllum Asparagoides	50
Solanum Jasminoides	15
" " Variegata	30
" Pseudo Capsicum, (Jerusalem Cherry)	15
Sollya Heterophylla, blue	50
Statice Lanata, flowers pale lilac, hardy	25
Stevia Compacta, flowers pure white, in large tufts	25
Stevia Rosea, flowers with a tinge of rose	25
" Serratifolius, small white flowers	25
Stapelia Asterias, erect growing	50
" Deflexa, trailing	25
" Mixta, tall growing	35
" Normalis, trailing	25
" Serpentina, trailing	25
" Woodfordiana, trailing	25
" Grandiflora, erect growing	50
Torenia Asiatica, azure blue flowers, tipped with violet	25
Thunbergia Alata Alba, flowers white	50
Tradescantia Aquatica, suitable for hanging baskets	20
Tradescantia Discolor, flowers white	25
" Latifolia	15
" Repens, creeping variety	15
" " Vitata	25
" Zebrina	15
Tritonia Aurea, flowers orange-scarlet	25
Tritoma Uvaria, (Red Hot Poker)	50
Tuberose, Double flowering	15
" Pearl, dwarf	20
Urtica Microphylla, a choice lawn shrub	50
Vallota Purpurea, flowers brilliant scarlet	50
VINCA.—ERECT VARIETIES.	
Vinca Alba, flowers pure white	25
" Occulata, flowers pure white with pink eye	25
Vinca Rosea, (Madagascar Periwinkle), flowers star-shaped	25
VINCA.—TRAILING VARIETIES.	
Vinca Aurea Reticulata	20
" Major, flowers blue	15
" Minor, flowers blue	15
" " Alba, flowers pure white	20
" " Aurea Variegata	25
" Elegantissima, flowers large, blue	25
" Harrisonii, flowers light blue, star-shaped	25
Violet Maria Louise	25
" Neapolitan	15
" Victoria Reginæ	25
Wigandia Caracasana	50
Yucca Aloefolia, (Spanigh Dagger)	25 to 2.00
" Filamentosa	50
" Flaccida	1.00
" Gloriosa	50
" " Variegata	2.00
" Recurva	30

NEW PLANTS.

COLEUS PICTUS.

A NEW and distinct species, from the Duke of York Island, sent out by William Bull, London, to dealers only, in 1877. Its divers colors are curiously blended and very effective, the leaves, which have a green ground, being more or less but variably flushed with yellow in irregular patches; the leaves are also marked in the direction of the veins with longitudinal bars, varying in size and outline, of a rich chocolate brown, which, where it meets the parts flushed with yellow, assumes a reddish-brown hue. The marginal teeth are bordered with chocolate color. These peculiar markings, and the unusual form of the leaves, give the plant a *bizarre* and curious appearance. 50c. each.

COLEUS MULTICOLOR.

Another remarkable species from the Solomon Islands, sent out by Veitch & Sons, London. Foliage bold and deeply laciniated, curiously marked and spotted with nearly all the colors of the rainbow, on a chocolate ground, (instead of green, as in *C. pictus.*) Sometimes the entire leaf becomes bright red. With the introduction of these new species we shall expect a new race of hybrid *Coleus*, of still more remarkable forms and colors than any heretofore obtained; and we hope and trust they will prove more constant and satisfactory than the old Chameleon, Shah, etc., which we are almost ashamed to sell. 50c. each.

COLEUS ELDORADO.

A fine green-house hybrid, with rich, yellow, smooth foliage, a narrow crimson edge and mid-rib. 25 cents each.

AMERICAN LOTUS.

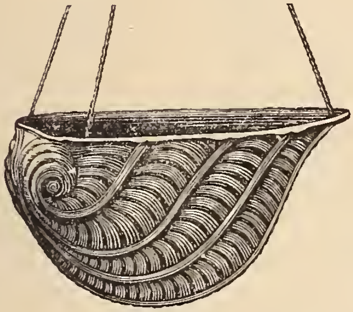
We are now prepared to furnish seed of this choice and rare aquatic plant, *Nelumbeum Luteum*, (the American Lotus,) collected in Northern Indiana and Michigan, at 50 cents a package.

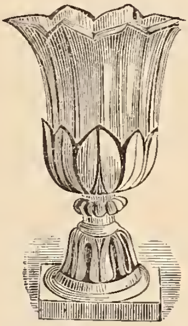
T. BOTT. G. W. SIMMONS. R. HAMMERSLEY.

BOTT, HAMMERSLEY & CO.

RICHMOND POTTERY.

Garden and Green-house Flower Pots and Saucers.---Plain and Ornamental Hanging Baskets and Vases.





NEW PRICE LIST.

	Per Doz.	Per 1,000.
2 inch Pots	$ 12	$5 85
2½ " "	15	6 90
Rose " (3 in. high, 2 in. wide,)	15	6 90
3 inch "	18	9 55
4 " "	25	13 25
5 " "	35	21 20
6 " "	50	31 80
7 " "	65	47 70
8 " "	80	58 30
10 " "	1 45	110 00
12 " "	3 00	265 00
4 inch Saucers	Per doz.	10
5 " "	" "	12
6 " "	" "	24
7 " "	" "	30
8 " "	" "	36
10 " "	" "	60
12 " "	" "	1 50

VASES FOR HOUSE PLANTS.

			Per Doz.
No. 1—	8¼ in. high,	7¼ in. diam.	$3 20
No. 2—	10¼ "	8½ "	4 80
No. 3—	12¼ "	9¼ "	6 40
Tulip Vases			3 20

HANGING BASKETS.

Beaded	Per doz.	$2 15
Octagon	" "	2 15
Rose	" "	2 15
Oak Leaf	" "	2 15
Shell	" "	1 65
Round	" "	1 10
Common	" "	65

All goods packed and delivered on cars at Richmond, free of cost, in good order, after which we are not responsible for loss or damage.

A liberal discount on car load lots. Sample orders must be accompanied with the cash. All orders over one hundred lots will be filled at thousand rates.

BOTT, HAMMERSLEY & CO.

MOSSES! MOSSES!

Green for Bouquets, Decorations, &c.

Peat Leaf Mould, Wild Plants of various kinds, in great variety,

FROM SWAMP AND FOREST.

☞If you don't see what you want, write and send sample, and we will try and find it for you.

TABLE OF PRICES.

	Per bbl.	Per 4 bbls.	Per 80 bbls.
Lycopodium, or Club Moss, - - -	$3.00	$10.00	$80.00
Running Lycopodium, - - - -	3.00	10.00	
Crow's Foot Moss, - - - - -	3.00	10.00	
Running Crow's Foot, - - - -	3.00	10.00	
Princess Pine, - - - - - -	3.00	10.00	
Sheet or Log Moss, - - - -	2.50	8.00	
Wintergreen, - - - - - -	4.00		
Packing Moss, or Spagnum, - - -	1.00	(per 10 bbls.) $ 8.50	
Evergreen Boughs, - - - - -	1.25	" " 10.00	
Peat or Leaf Mould, - - - -	1.25		

Christmas Trees, 3 to 6 feet, $12.50 per hundred.
" " 6 to 8 " 15.00 "
" " 10 to 12 feet, 50 cents each.
Pitcher Plants, $1.50 per 12, $7.00 per 100.

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SPARTA, WIS.

TREES AND SHRUBS.

I AM OFFERING A VERY LARGE VARIETY OF

American Evergreeens and Deciduous Trees, Shrubs, &c.

VERY CHEAP, FOR CASH.

Small orders can be sent by mail, and warranted to arrive in good order.

ONLY READ THIS!

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☞Write for Price List.

J. C. PINNEY,
STURGEON BAY, WIS.

ARIZONA PLANTS.

Having resided in Arizona for the past ten years, during which time I have visited nearly all parts of the Territory and studied its peculiar flora, I am now prepared to furnish, on short notice, by mail, post-paid,

FRESH SEED OF TREES AND PLANTS,

SMALL SUCCULENT PLANTS, and

DRIED HERBARIUM SPECIMENS,

Of all the native Plants, at very reasonable rates. Also,

PENCIL OR INDIA INK DRAWINGS,

—AND—

WATER COLOR PAINTINGS,

True to nature, of large, characteristic plants, peculiar to this country.

☞ Correspondence solicited.

ADDRESS,

JOHN A. SPRING,
TUCSON, ARIZONA.

FLORIDA PLANTS.

I am now prepared to furnish, to any address, both

LIVING FLORIDA PLANTS

—AND—

DRIED HERBARIUM SPECIMENS,

In any quantity desired. The living Plants and Roots will be carefully packed in moss, and can be shipped to any part of the country in safety, and are worth

50c. per Doz., or $2.00 per 100 Plants, of a kind.

Each Plant in the HERBARIUM SPECIMENS is carefully labeled with a printed label, and worth $8.00 per 100.

☞I can also furnish SEEDS of a great many varieties of choice Flowering Annuals, as well as fine Ornamental Shrubs, at the lowest possible price.

ADDRESS,

A. H. CURTISS,
JACKSONVILLE, FLORIDA.

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L. B. CASE'S
BOTANICAL INDEX
TO THE
New, Rare and Beautiful Plants,
GROWN AND FOR SALE AT HIS COMMERCIAL GREENHOUSES,
RICHMOND, IND.

VOL. 1.—NO. 6. JULY, 18[illegible]. Published Quarterly, at 25 Cents a Year.

TORREY BOTANICAL CLUB. NEW YORK.

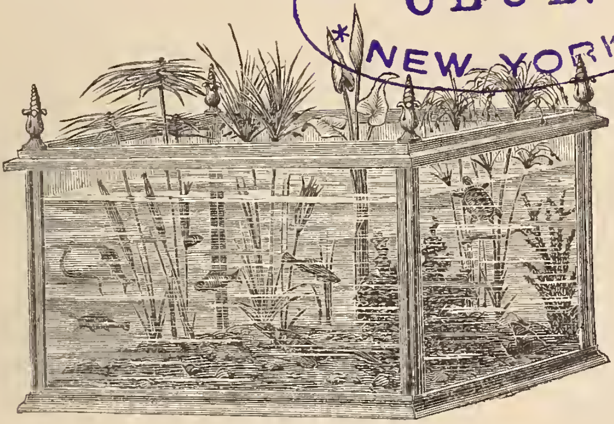


FIG. 45.—*Aquarium.*

AQUARIUMS.

ONE of the most pleasing and instructive ornaments about a home is a successfully managed fresh-water Aquarium, well filled with an appropriate selection of plant and animal life in healthy condition. But as very few people ever make a success of it, perhaps a short article devoted to their treatment may be of service to some of our readers. It is often said that an Aquarium will thrive better with neglect than care, (after being once properly started), which to a certain extent is correct; for the constant changing of water, plants and fish, only tends to weaken both and shorten their lives, in their strange and unnatural condition.

Almost any kind of an open-top vessel can be utilized into an Aquarium, for plants will grow just as well in an old wash-tub as in a gilded iron-frame tank; the great point to be attained being pure water and a healthy condition of plant and animal life. In fact, some of the finest Aquariums we ever saw were only wooden frames with glass sides; but these are usually objectionable from the fact that they are so liable to leak, and soon decay enough to make them unsafe to stand in a house. The great demand for a durable and ornamental Aquarium, adapted to the conditions and requirements of the home, the office, the hall, and conservatory, has resulted in many improvements and patents, so that the manufacturers now offer at moderate prices very ornamental iron-frame Aquariums, with glass sides, which, considering their durability, are in the end the cheapest.

The principles that govern it are simple and easy, if one only studies to obey the laws of nature, not *science*—for it is only equivalent to a well ventilated house. The laws of animal and vegetable life exist just the same in the water as on the surface of the earth; growing plants evolve oxygen, which is the vitalizing element of animal life, and the exhalation of animals is carbonic acid and gas, which is the vitalizing element of vegetable growth; hence, the exhalation of one kingdom furnishes the vitalizing element for the other. But no definite rule can be laid down by which animal and plant life can be equalized in confinement together. Its successful workings entirely depend upon that balance between the two in which plants give off as much oxygen as is required for the animal life, and that there should be no more animal exhalations than the vegetation will absorb. When once properly adjusted, the Aquarium requires but little more attention than to remove decaying vegetable matter, and to keep the *confervæ* (green scum) removed from the inner surface of the glass. This can be done with a sponge or rag fastened to a stick, moving it slowly in a vertical direction, so as not to agitate the water. The rock work and terre cotta ornaments should also be taken out and thoroughly washed upon its first appearance, for this is the greatest enemy to a healthy Aquarium.

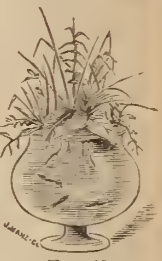


FIG. 46.

In preparing the Aquarium, spread an inch or two of clean, coarse sand over the bottom, and to be sure there are no particles of vegetable mold mixed with it, wash it well by putting it in a sieve and pumping clear water on it, as long as any impurities or muddy water run from it. Plant in the sand some good aquatic plant, laying over the roots small stones to hold them in place until the plant has anchored itself by new roots. Most plants will thrive in sand and water just as well as in loam. If it is desired to grow *Richardia hestata*, *R. maculata*, *Caladiums*, or *Amorphophallus*, they will flourish better if potted in shallow pots of good rich loam and set upon the sand, then covering the pots with small stones or pebbles to prevent them from being upset or moved about, also to prevent fish from stirring up the mud. Next, arrange the stone and ornaments, being very careful to have them stand firm, so there will be no chance to fall against the glass and break it. After arranging sand, plants, and ornaments, fill the Aquarium to the desired height with fresh water, taking care not to wash the sand from the bottom. Then it is especially desirable to throw in a handfull from some of the following list of plants, to float about and supply oxygen until the plants just set out take root, viz: Water-feather, (*Hottonia inflata*); Mare's-tail, (*Hippuris vulgaris*); Eel-grass, (*Vallisneria spiralis*); Ditch-grass, (*Anacharis Canadensis*), etc. Also, small mussels, snails, etc., but do not put in fish until after the water has settled.

There is a great variety of hardy native plants, or weeds, growing in all the streams, that can be introduced into the Aquarium with good effect—for almost all plants growing in the streams will do well in an Aquarium; but they are often thought to be too common to be pretty. Tropical plants, such as are kept at the greenhouses for sale, are probably the best, as they will remain vigorous all the year round. We add a list, with their prices, (on page 86,) best adapted, for reference; nearly all dealers can supply any from the list.

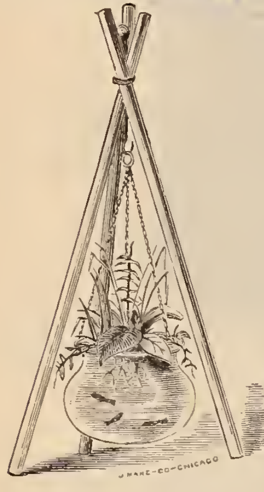


FIG. 47.—*Gypsy Kettle.*

And now it will be in order to stock it with animal life. Gold and silver fish are the popular varieties, but perhaps no greater pleasure can be derived than from a good selection of native river fish, (snails and small mussels having already been introduced). Dace, silver-sides, chub minnows, red-bellied minnows, barbet, stone-loach, perch, roach, water lizards, eels, etc., being easily obtained in almost any quantity, from the small streams and ponds. The fish will gradually devour the snails as they can find them protruding from the shells, and it will be necessary to repeat the excursions to the streams or swamps to replace those devoured. The most useful snail for the Aquarium is the *Planorbis*, which is the best of all for keeping down the moss from the glass sides, which they seldom leave. The *Lymnea* are also excellent cleaners, but have a strong propensity for eating some of the plants. The *Paludina*, *Bithinia*, *Physa*, etc., are also good sanitarians; but the bivalves (*Unio*, etc.,) are more ornamental than useful, but add a peculiar charm to it.

When the water becomes foul or green, draw off all but enough to cover the fish, using a syphon, which any tinner can make in a few minutes, but your druggist can get you a neat glass one for a small outlay. The same syphon can be used to fill it again with fresh water (not too cold) and not disturb the sand bed.

The Aquarium must not stand in the direct rays of the sun, as it would soon absorb the oxygen contained in the water and kill the fish. However, it must stand in a light and airy situation, for light and air are the two essential elements to health, either in the Aquarium or home.

A proper knowledge and judicious execution of feeding will probably do more to make the Aquarium a success than most people imagine. Small fish require very little food after the plants have commenced growing, for growing plants will supply a large amount of minute insects (*animalcule*) and *confervæ*, which is the natural fish food; but before this is supplied a small amount of prepared fish food is necessary, or if that cannot be readily obtained, crumbs of home-made bread, crackers, vermicelli, white of an egg boiled hard and minced very fine, fine pieces of lean beef, mutton, or boiled liver, as well as flies, soft insect food of any kind, particularly earth-worms. Never feed more than two or three times a week, and be very careful to remove all crumbs of food that may be left after feeding, as it would soon decay and produce disease.

Spread a paper over the Aquarium while sweeping, and remove the small particles of soot or other impurities that may accumulate on the surface of the water, by taking a piece of stiff paper or card, and after thoroughly saturating it with water draw it over the surface, the soot will adhere to the damp paper and can thus be removed more easily than by any other method.

In short, use a great deal of common sense; keep the Aquarium clean, the water pure, never put in enough plants to make it appear crowded, never introduce more animal life than the oxygen of the plants will sustain, never stir the water to see the fish swim, and above all do not handle the fish. Avoid all sudden changes, such as heat and cold.

Thus far we have treated exclusively of Aquariums, but as the glass globe is such a neat and pretty ornament for an office, dining room, library, etc., a few words must be said of them. We gave in Fig. 38, (April No.), a representation of a glass globe with a *Richardia* (*Calla*) growing in it, the globe resting on a terra cotta base, (Dolphin pattern.) The same globe can be suspended by cord or small brass chains, making a hanging globe. Fig. 47 represents the *new idea*, called the "Gypsy Kettle," which is a globe suspended to three upright rods; and Fig. 46 is a globe and pedestal of glass cast as one piece. In all these globe patterns one good plant is sufficient, and only one or two small fish can live in a healthy condition.

PRICE-LIST OF AQUARIUMS AND FIXTURES.

[We do not keep Aquariums, nor any of the Fixtures in stock, but will quote the usual prices and undertake to furnish anything desired at short notice. We can furnish the Plants at any time.]

GLASS FISH GLOBES.

½	Gallon,	standing, (Fig. 46)	$1 00
1	"	"	1 50
1½	"	"	1 75
2	"	"	2 25
2½	"	"	2 75
3	"	"	3 40

3	inch,	hanging, (Fig. 38),	chains extra	$ 30
5	"	"	"	40
6	"	"	"	60
7	"	"	"	75
8	"	"	"	1 25
9	"	"	"	1 50
10	"	"	"	1 75
11	"	"	"	2 00

Brass Chains, for hanging, 15c. to 20c. per yard. Terra Cotta Bases, (Fig. 38,) 75 cents each.

GYPSY KETTLE, (Fig. 47.)

No. 1, 12 inches high, 3½ inch Globes	$1 00
No. 2, 14 inches high, 4 inch Globes	$1 25

AQUARIUMS, (Fig. 45.)

			Frames.	With Glass.
Square,	8x12 in.	8 in. high	$ 4 75	$ 7 00
"	12x18 "	10 "	6 50	10 00
"	12x20 "	11 "	7 75	12 50
"	14x28 "	14 "	12 00	17 50
"	16x32 "	16 "	20 00	40 00
"	18x36 "	18 "	30 00	50 00

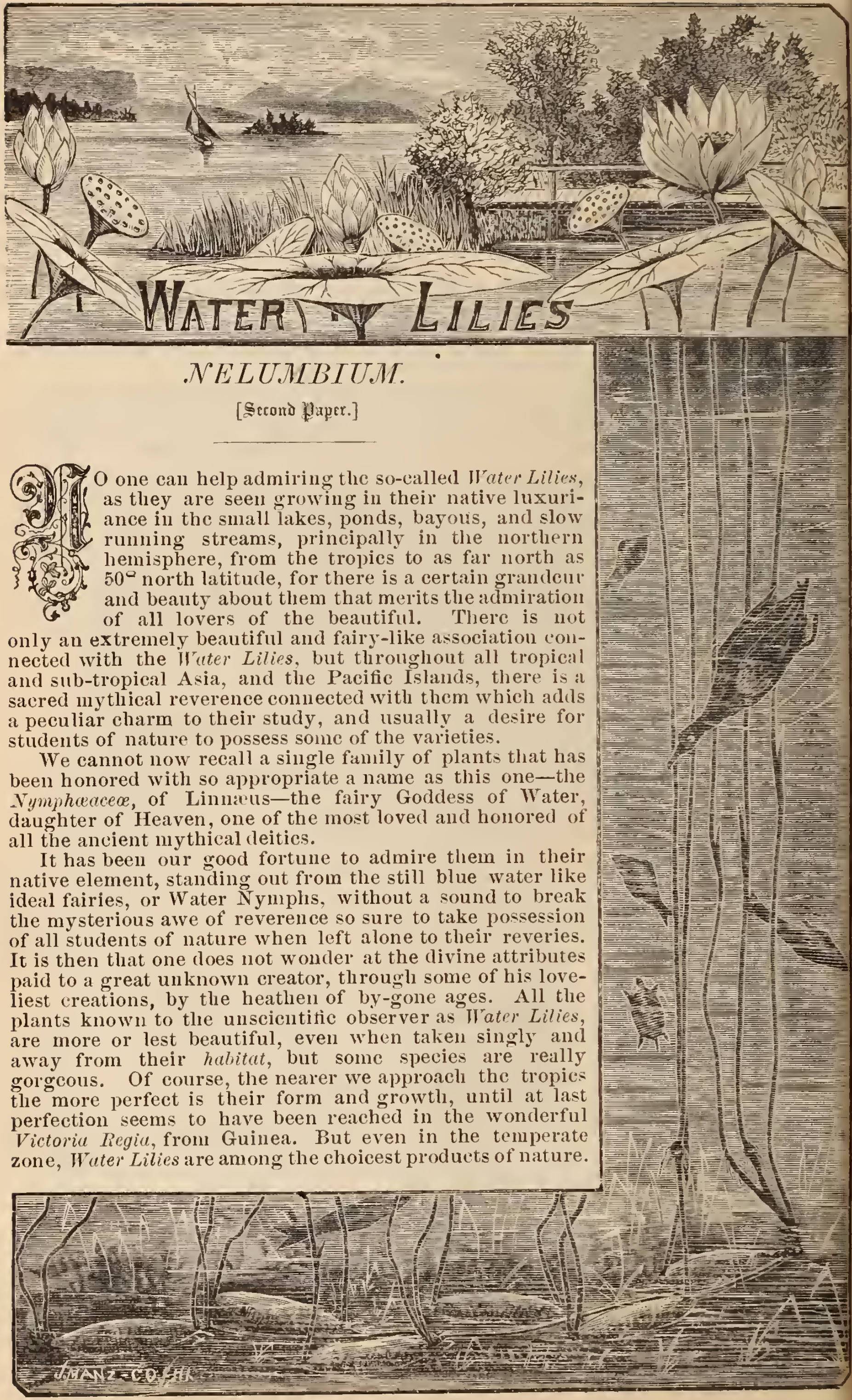
Hexagon, 3 Gallons	$ 3 00
" 5 "	5 00
" 12 inches diameter	7 00
Octagon, 22 " "	22 00

TERRA COTTA ORNAMENTS.

Castles, Towers, Fish, Turtles, Frogs, Lizards, etc.	25c. to 75c.

LIVING SPECIMENS.

Fish, Gold and Silver Carp,	50c. each; $4.50 per dozen.
Native Fish, Eels, Lizards, etc.	25c. each.
Fresh-water Snails and Mussels	5c. to 25c. each.
Fish Food, per mail, prepaid	15c. per box.


J.MANZ-CO.CHI.

WATER LILIES

NELUMBIUM.

[Second Paper.]

NO one can help admiring the so-called *Water Lilies*, as they are seen growing in their native luxuriance in the small lakes, ponds, bayous, and slow running streams, principally in the northern hemisphere, from the tropics to as far north as 50° north latitude, for there is a certain grandeur and beauty about them that merits the admiration of all lovers of the beautiful. There is not only an extremely beautiful and fairy-like association connected with the *Water Lilies*, but throughout all tropical and sub-tropical Asia, and the Pacific Islands, there is a sacred mythical reverence connected with them which adds a peculiar charm to their study, and usually a desire for students of nature to possess some of the varieties.

We cannot now recall a single family of plants that has been honored with so appropriate a name as this one—the *Nymphæaceæ*, of Linnæus—the fairy Goddess of Water, daughter of Heaven, one of the most loved and honored of all the ancient mythical deities.

It has been our good fortune to admire them in their native element, standing out from the still blue water like ideal fairies, or Water Nymphs, without a sound to break the mysterious awe of reverence so sure to take possession of all students of nature when left alone to their reveries. It is then that one does not wonder at the divine attributes paid to a great unknown creator, through some of his loveliest creations, by the heathen of by-gone ages. All the plants known to the unscientific observer as *Water Lilies*, are more or lest beautiful, even when taken singly and away from their *habitat*, but some species are really gorgeous. Of course, the nearer we approach the tropics the more perfect is their form and growth, until at last perfection seems to have been reached in the wonderful *Victoria Regia*, from Guinea. But even in the temperate zone, *Water Lilies* are among the choicest products of nature.

In a botanical point of view, they are not a lily, nor is there anything approaching the structure of a lily, for scientifically they are their antipodes; or, if the *Nymphæa* were placed among the first families of plants in a botanical nomenclature, the lily would be near the last of the series, for there is nothing in common between the two plants. The so-called *Water Lilies* are nearly all arranged under the head of *Nymphæa*, and comprise nine genera, according to Sir Joseph Paxton, and include the *Nelumbium*, *Nymphæa*, *Nuphar*, *Victoria*, *Castalian*, *Colombo*, *Nectris*, *Eurgall*, and *Brassenia*, but as space will not admit of a review of all the genera in this family, we will for this number take the *Nelumbium* for consideration, and in the next number we hope to treat of the typical form of the family, the *Nymphæa*.

The name *Nelumbium* is the native Cingalese name, Latinized by Jussien and adapted to all languages, but like the most of the Oriental names, its meaning is unknown. There are but two species of the *Nelumbium* known to botanists—*N. speciosum*, Linnæus, from the old world, with rose-colored flowers, varying, however, from pure white to a light blue, and *N. lutea*, the American species, with light, Canary-yellow flowers, which also vary in color from white to pink. *N. speciosum*, however, is known to botanists as well as plant dealers, by several varieties, viz: *N. speciosum alba*, with white flowers, from India; *N. speciosum Caspicum*, with pink flowers, from the Caspian sea: *N. speciosum Jamaicense*, with pale blue flowers, from Jamaica; *N. speciosum tamera*, with pink flowers, from Malabar. The old world species have a wide geographical range, being found in Australia, the Phillipine Islands, throughout the East Indies, in Asia as far north as the Caspian Sea, and doubtfully in the West India Island of Jamaica. There can be no reasonable doubt of its former *habitat* of the Nile, and probably other portions of Northern Africa. However, like many other plants that are known to have flourished there in ancient times, it is now no longer found there. The "Treasury of Botany" tells us that "Herodotus describes the plant with tolerable accuracy, comparing the receptacle of the flower to a wasp's nest. Strabo and Theophrastus likewise mention the plant as a native of Egypt." Antiquarians appear to be very uncertain in regard to the identity of the Egyptian *Lotus*. Some affirm it to be the *Nelumbium*, while others attempt to prove the *Lotus* to be the nut of *Celtis australis*, both of which are equally valuable as food. The nuts, as well as the root or tubers, of *Nelumbium*, are still a very important article of food in India, China, Australasia and Polynesia. In a manuscript of Dioscorides, supposed to be of the 12th century, formerly in the Rinuccini Library, at Florence, there is a figure of the *Nelumbium* under the name of *Kuamos*, (bean), while under the name *Lotus* a tolerably good representation of *Celtis australis* is given.

All ignorant and superstitious people require a symbol or parable as a prototype to illustrate the ideas they wish to convey, especially the object of their veneration, which is very aptly illustrated by the peculiar leaf of the *Lotus*, as it is covered by a fine, glaucous, microscopic bloom or down, which, by retaining a film of air over the upper surface, prevents its being wetted when water is poured on it, the water rolling off in drops with the appearance of molten silver. The devout Hindoo has a proverb founded on this peculiarity of the leaves, to the effect that "the good and virtuous man is not enslaved by passion nor polluted by vice; for though he may be immersed in the waters of temptation, yet like a lotus leaf he will rise uninjured by them." (It must be remembered that the Hindoo are, as a sect, the most devout people in the world.) There certainly was a religious or superstitious reverence paid this plant, as is proved by the sculptures on the ruined Egyptian temples, while many other circumstances clearly prove the veneration paid to this plant by the votaries of Isis; and this superstitious reverence is still continued throughout Australasia and Polynesia, at the present day, where the plant is deemed sacred and is employed in religious invocations and ceremonies.

But let us now examine the peculiar character of our venerable plant, and as we have only our native species before us, we will talk more especially of *Nelumbium luteum*; however, a description of one species will in a general way answer for both In the illustration on page 76, we wish to convey an idea of the plant as it would be seen in its natural condition, if we had the power to remove a vertical section of the water immediately in front of a growing plant, and still allow the plant and surrounding water to remain *in situ*. The tubers and roots of the plant are here seen lying horizontally in the muddy bed of the river, with only a thin covering of mud over them, and often a number of tubers connected together by a long, tough, woody, but porous vine, (root-stock.) From the joint formed by the union of the tubers and root-stock spring the leaf and flower-stems, while from the free end of the tuber also often grow additional leaves. The tuber contains a large per centage of mucilaginous and farinaceous matter, and is said to be one of the best known native vegetables for food. Fig. 50 represents a mature tuber cut into halves, showing the peculiar cavities that traverse the entire tuber. It also contains the fine silky fiber noticed in the stems, but having less strength and are perhaps finer. Upon cutting the tuber open, they exude a large quantity of thick, milky, mucilaginous matter, which runs off in large drops. The leaf-stems are round, tough, and contain a fine, silky fiber, arranged spirally in the stalk, which the Hindoos draw carefully out, and after twisting together use as wicks in the sacred lamps of their temples. The stem is traversed its entire length with air canals, regularly arranged, which are fed from the breathing pores at the center of the leaf. The curious leaf is from one to two feet broad, round, dish or bowl shaped, with prominent radiating venation, and, as before stated, covered with a down, except a small space at the center of the leaf opposite to its junction with the stem, where are only found the stomates or breathing pores that communicate directly with the air canals of the stalk. This is of a lighter color, and devoid of the covering of down, etc. At first the young leaves float upon the surface of the water, but as the plant acquires age and strength the leaf-stems lengthen and carry the leaves from one to two feet above the surface of the water. The young leaves, before coming to the surface of the water, are inrolled at the sides, very similar in general form to the new growth of the *Nymphœa* and *Sagittaria*, or as very imperfectly represented by the *Richardia* (*Calla*) except that in place of assuming an arrow-shaped form, as in the last three named, the *Nelumbium* leaves present only one wing of the arrow point, which perhaps would compare better to the general form of the barbed point of a fish-hook. This is very indefinitely represented at the upper ends of the two outside stalks, in Fig. 49, which is intended to represent two young leaf-stems before reaching the surface of the water. Upon the leaf-stems, a few inches above the tuber—usually near the surface of the mud—is often seen a circle of long, fibrous rootlets, forming as it were a perfect crown, from which new leaves spring and new and separate plants are formed. The center stem in Fig. 49 represents an old leaf-stock growing from near the end of the root-stock, and showing the peculiar mode of producing new plants from the callous, or corm, on the stem; also the position of the air canals in the end of the leaf-stem, as also in the root-stock, *b*.

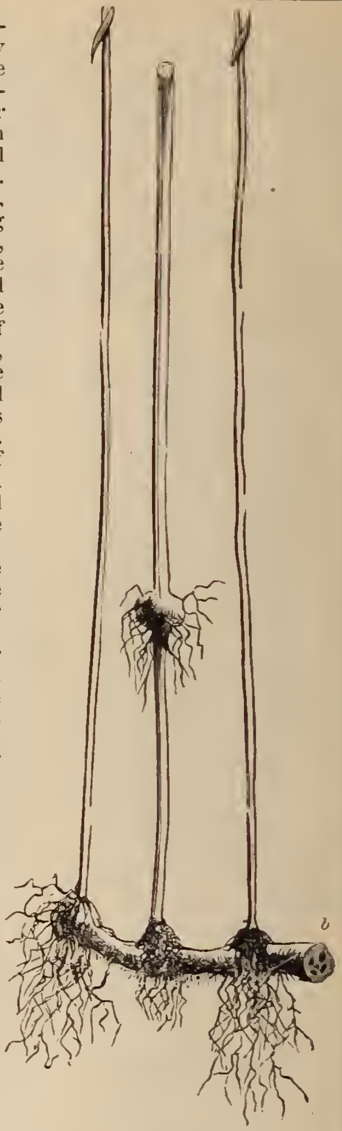


FIG. 49.

But if the roots and leaves are curious, the flower and seed receptacle are still more so. The flowers appear in June and July, and are often five inches across when fully expanded. They are borne singly on long stems, similar in structure to the leaf-stems, and stand about one foot above the foliage—semi-double, of a light canary-yellow color, exquisitely fragrant, opening as the sun warms the atmosphere in the morning, but closing again on the approach of evening. In the center of the flower is the as yet undeveloped seed-pod, or *torus* of botanists, Fig. 51, containing the little ovules, (seed), distinctly and prominently seen rising like miniature pyramids above the flat surface of the *torus;* but as the flower matures the *torus* grows very rapidly, so that by the time the petals drop it has nearly attained its full size and the ovules their full development.

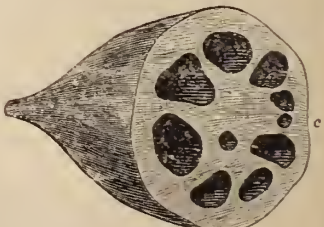


FIG. 50.—*Tuber of Nelumbium.*

The *Nelumbium* is nowhere in the United States a common plant, and although it is pretty widely distributed, it does not seem to increase to the extent that any other hardy plant does. This may be accounted for by a variety of reasons, but particularly because the seed are very light, and when once freed from the *torus* they float off to be eaten by water-fowls, or animals living near the water; and as the roots contain such a large amount of starchy matter they are also sought for by the same animals for food. We have been to some trouble to ascertain the different localities in the

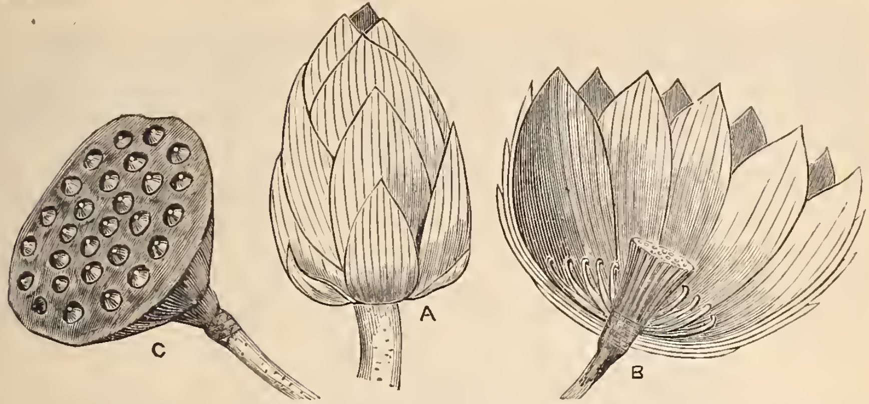


FIG. 51.—*Flower, Bud and Torus of Nelumbium.*

Northern States where it is now found, but do not propose to designate the localities so accurately that curiosity hunters can readily find and destroy them. However, we have nearly all the exact localities, and could furnish them to any one for special study. They are near Chicago and Peoria, Illinois; Crown Point, Terre Haute, Seymour, Indiana; Kalamazoo, Monroe, Islands in the Detroit River, Vicksburg, Indian Lake, Michigan; Toledo, Sandusky, Painesville, Ohio; Sodus Bay, New York; Lyme, Connecticut; near Philadelphia, Pa.; Platte River, Nebraska. We have been told of several places where they are said to grow, but after a careful examination of the localities, and with the assistance of correspondence, they are found not to exist there. We would be pleased to learn of other localities where they are known to grow, for a special purpose, and would thank our friends for information regarding them. It will, however, be seen they are not a common plant north of the Ohio river, and probably never was—their presence here being now pretty generally attributed to the agency of the aborigines. In the Southern States they are probably more plentiful; but in Chapman's "Botany of the Southern States," he says: "Lakes and still water, Florida, near Tallahassee, and northward and westward. Not common." In Young's "Flora of Texas," he says: "Eagle Lake, near Columbus;" and we know they grow near Baton Rouge, Louisiana. So that even Southern authors, who are familiar with the subject, do not consider them common even in the South. Their large and peculiarly shaped leaf would call immediate attention of their presence to collectors; while the very curious *torus* would not only attract the curiosity hunter, but would be a sure and definite proof to the botanist of their presence. We must therefore consider them as being widely scattered geographically, but only few in numbers in each single locality. It is to be hoped that where they now are established they will be protected from the wholesale destruction always following the discovery of any rare or strange object of interest. This is now being done by the owner of the Vicksburg pond, Michigan, for the protection of the few remaining plants. We would also suggest to plant lovers who have ponds of water under their control, or who live near slow running streams, small lakes, etc., that they plant at least a few seeds to grow where they can watch and protect the plants as they mature. It has been suggested by several botanists, who are reviewing the different species and genera of plants, that as the *Nelumbium* is not a very common plant, perhaps new facts might be obtained in regard to them if those who have access to fresh plants would correspond with some of the botanists that are revising the flora of North America. We shall take pleasure in forwarding any correspondence to the proper authors desired.

They have not been introduced into cultivation in America, to any great extent; but as they are often met with in European collections, their treatment, as given by Sir Joseph Paxton, will be of use to any one wishing to experiment with them. He tells us: "They require to be grown in rich, loamy soil. The tank or tub in which they grow should be kept full of water while the plant is growing, but may be allowed to get dry when the flowering season is over. They require a strong heat to flower. They may be increased by dividing the roots, but are more readily grown from seed."

There can be no reasonable doubt of their utility and adaptation in the near future to American floriculture, and we hope to see them more generally in use. They can be very easily grown by planting in a barrel with a few inches of mud in the bottom, and the barrel filled with water; the barrel, however, should be set in the ground to prevent being turned over, which really makes a cistern or tank of it. But a much better plan, even if it does cost a little more, is to wall up and cement a small basin in the ground to grow the plants in during summer, which, by a little care and expense, can be protected so that frost will not reach down to the tubers during winter; for it is quite certain they will stand no frost, but lay dormant during winter below the frost line, and start to grow again when the heat of the sun warms the water sufficient to start circulation in the plants.

[After the article on *Nelumbium* was in type, and could not be changed in the pages, we have thought best to add a few words as a note in regard to the tubers. Fig. 50 is the exact size and form of a tuber which we cut in halves and stamped on paper, which the artist has transferred to the engraver's block. The air chamber in the center, and the two in the upper surface, are very small, while those at the bottom are quite large. The tubers are from three to five inches long, and from one to one and a half inches in diameter; smooth, and very similar in form to a common sweet potato. In the profile view, Fig. 50, it is represented as laying on its side, the upper surface being at the letter *c*.]

In the October number of the Index we propose to give a short, illustrated, popular article on the *Nymphæa*, and would be pleased to receive from some of our friends a specimen—root and all—of *Nymphæa tuberosa*. We have never yet been fortunate enough to secure one, although we have collected plenty of *N. odorata*. There is very little difference in the two species, except *N. odorata* has a long, continuous root-stock, while *N. tuberosa* produces tubers from a smaller root-stock.

GEOGRAPHICAL BOTANY.

SYRACUSE, N. Y., FERNS.

The following list of forty-four *Ferns*, (species and varieties), was made by L. M. Underwood, of Syracuse, N. Y. Of the *Ferns* mentioned as growing in the locality, all but three or four have been found by him; the others being given on the authority of other botanists of that city. It is doubtful if any one locality in the United States can furnish so great a variety of this interesting botanical family, *Felices* or *Ferns*.

List of Ferns growing in the vicinity of Syracuse, Onondaga Co., N. Y.

ORDER FILICES.

SUB-ORDER, POLYPODIACEÆ.

Polypodium vulgare, L.
Adiantum pedatum, L.
Pteris aquilina, L.
Pellæa atropurpurea, Link.
Asplenium trichomanes, L.
A. ebeneum, Ait.
A. ruta-muraria, L.
A. angustifolium, Michx.
A. thelypteroides, Michx.
A. filix-fœmina, Bernh.
Scolopendrium vulgare, Smith.
Camptosorus rhizophyllus, Link.
Phegopteris hexagonoptera, Fee.
P. dryopteris, Fee.
Aspidium thelypteris, Swartz.
A. noveboracense, Swartz.
A. spinulosum, Swartz.
A. " *var. intermedium.*
A. " *var. Bootii.*
A. cristatum, Swartz.
A. " *var. Clintonianum.*
A. Goldianum, Hook.
A. marginale, Swartz.
A. acrostichoides, Swartz.
A. " *var. incisum.*
Cystopteris bulbifera, Bernh.
C. fragilis, Bernh.
C. " *var. dentata*, Hook.
Struthiopteris Germanica, Willd.
Onoclea sensibilis, L.
O. " *var. obtusilobata*, T.
Dicksonia punctilobula, Kunze.

SUB-ORDER, OSMUNDACEÆ.

Osmunda regalis, L.
O. Claytoniana, L.
Osmunda cinnamomea, L.
O. cinnamomea, var. frondosa.

SUB-ORDER, OPHIOGLOSSACEÆ.

Botrychium simplex, Hitch.
B. lanceolatum, Angstroem.
B. matricariæfolium, A. Br.
Botrychium Virginicum, Swartz.
B. ternatum, Swartz.
B. " *var. lunarioides*, Milde.
B. ternatum, var. obliquum, Milde.
Ophioglossum vulgatum, L.

[We are under many obligations to Mr. Underwood for the above valuable list, which indicates an enthusiastic collector, and hope to receive for publication similar lists from other localities. Mr. Underwood would be pleased to exchange *Ferns* and rare flowering plants for varieties not in his collection. His collection embraces about 125 species of growing Foreign and American *Ferns*, including Southern and far Western species not in common cultivation.—Ed.]

L. B. CASE
RICHMOND
IND
FROM
J.V.&S.
LONDON
L. B. CASE
IND. RICHMOND

NEW & RARE PLANTS

[We would request any one having new or strange Plants, to send us a notice for publication in these columns.]

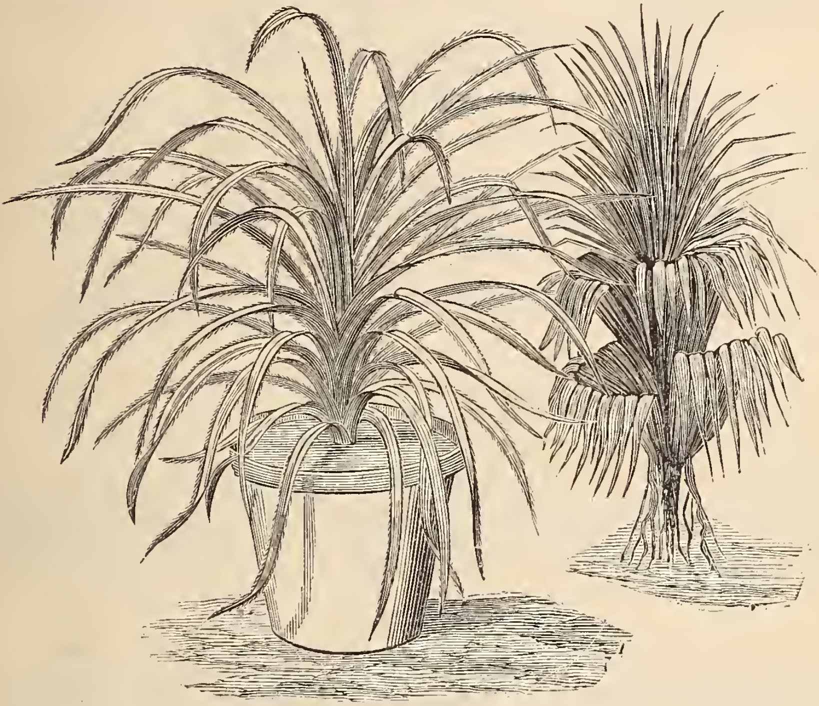


FIG. 52.

PANDANUS VAN GEERTI.

This charming *Pandanus*, from the east coast of Africa, is of compact habit, with numerous narrow leaves finely serrated, slightly twisted in form of growth. The leaves, gracefully falling back around the pot in which it grows, are of a pale yellowish-green color, becoming a distinct orange at their insertion of the stem, also the little thorns which grow along the ribs of the leaf. The lower face of the leaves are covered with a fine white powder or dust, which adds much to its distinctive merit. It is a very slow grower—the strongest plant of the first few that reached Belgium, making only 30 centimetres (12 inches) in height, and 15 millimetres (three-fourths of an inch) in breadth, in five years. *Pandanus Van Geerti* is one of the most distinct and beautiful species yet discovered, and has already received several prizes at the European plant exhibitions. Sent out by August Van Geert, Ghent, Belgium, in 1873, and figured in his *New Plant Catalogue*, from which we have taken the liberty of making a copy and this description.

In the long list of ornamental foliage plants, there are very few that equal the *Pandanus*, the Screw Pine of travelers, and probably none excel a well grown specimen for decorating a conservatory or small greenhouse establishment. They are however, comparatively rare in American collections of choice plants, and not sufficiently known to many of our readers to be familiar; hence, we have chosen one of their number to figure as a representative of the genus. But a plant as seen growing in a flower-pot or tub in a greenhouse will convey but a faint idea of the plant or tree in its *habitat*, and in the background in Fig. 52 we have given a representation, after Blume, of *Pandanus latifolius*, from Java. We also give the descriptions of a few of the new ones found during the past few years, and which are considered the finest species.

Perhaps we should say, in explanation of the term Screw Pine, that it is not from any fancied or supposed resemblance to the pine tree as we see them, but on account of their habit and form of growth being so similar to the Pineapple, (*Ananassa.*) which is always called "*the* Pine" in the tropics, by the English-speaking people.

PANDANUS CERAMENSIS.

A dwarf-growing species from the Island of Ceram, with a neat spreading tuft of dark green, grassy leaves, carinate, distinctly spiny on the margins and slightly so on the secondary ridges of the upper surface, while the keel is free from spines.

PANDANUS ELEGANTISSIMUS. A. VERSCHAFFELT.

One of the most ornamental species of the Screw Pine family. Leaves very long, narrow, and gracefully recurving; arranged systematically in spiral form around the stalk, each leaf strongly margined with sharp spines. A strong grower, with dense foliage.

PANDANUS GRAMINÆFOLIUS.

A fine, dwarf-growing species, with long, narrow, recurved foliage, of a clear green.

PANDANUS LINNEI.

A rare *Pandanus*, of a strange greenish-gray color, in the style of *P. Javanicum variegata*, but the leaves are longer and more recurved, with strong spiny edges.

PANDANUS ORNATUS.

Foliage of a splendid dark, shining green, well reflexed and deeply serrated. Leaves margined and backed with short white spines.

PANDANUS PANCHERI. LIND. ET ANDRE.

A splendid species discovered by M. Pancher, upon the mountains of the Island of New Caledonia. Its leaves are long, narrow, and lengthwise acuminate, of a deep bluish-green color, and edged with red soft spines. Easily grown in a temperate greenhouse, consequently will thrive as a house plant. M. Pancher, in his enthusiasm, compares this species to the water fountain of the Palais Royal, Paris, on account of its graceful form.

PANDANUS TENUIFOLIUS.

A small growing species, forming a slender, ascending stem, clothed with long, narrow, rich green linear-lanceolate leaves, 12 to 16 inches in length, set with rich red-crimson spinulose serratures on the margins. The gracefully decurved habit of growth renders it a charming species for select decorative table groups, and not less valuable as a single specimen for a vase or epergne.

PANDANUS VEITCHII.

Discovered by J. G. Veitch, as also by several other botanical travelers, in the South Sea Islands, about the same time, and sent out by Veitch, Bull, and the Belgium dealers, simultaneously. Leaves of a bright green color, beautifully marked with broad bands, stripes, and fine lines of pure white; each leaf often 2 feet in length to 3 inches in width, growing erect from the stem, but most gracefully curving towards the end.

BEAUTIFUL CYCLAMENS.

By what we read in the English periodicals, we see how great has been the improvement in *Cyclamens;* but a sample from Mr. Barker of Norfolk, Va., shows that they are even more beautifully improved than we supposed. This sample comprises fifteen different shades of color or form. They seem to be a mixture of three species, *Cyclamen coum*, *C. persicum*, and *C. Europœum.—Gardener's Monthly.*

ANTHERICUM VITATUM VARIEGATUM,

From the Cape of Good Hope. This is certainly one of the finest of this class of ornamental foliage plants that has been offered for years. Leaves 15 to 20 inches long, gracefully recurved; very bright green; deeply edged and striped with white. It has been compared by many to *Pandanus Veitchii*, which it resembles in its general appearance. Easily grown in any greenhouse or window. A beautiful plant for the center of stands or vases. Said to be quite hardy.

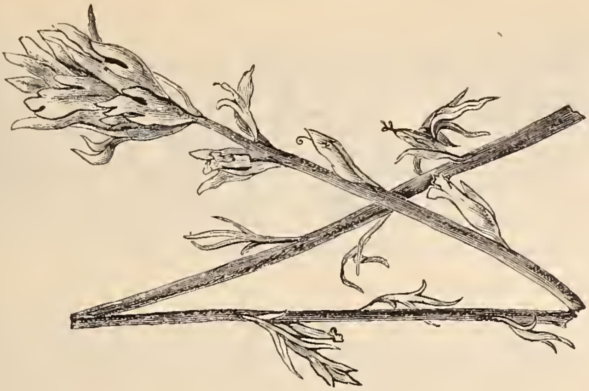


FIG. 53.

Although the plant figured on this page is a common American plant, and may seem out of place arranged under the heading of "New and Rare Plants," still we doubt very much if one half the readers of this article ever saw it or even knew of its existence. We think that it ranks among the most beautiful native plants we have, and never was more thoroughly impressed with this belief than this spring, (last of April and first of May,) when we saw it in full bloom. In fact, we were so well pleased with it that we have decided to give an illustration and short description of it in this number.

CASTILLEJA COCCINEA. (PAINTED CUP.) Sprengel. (*Fig. 53.*)

The genus *Castilleja* was dedicated to Don Castilleja, of Cadiz, an eminent Spanish botanist, and our species has been carefully described by Profs. Gray and Wood. They are a low growing herb, with rough or hairy stalks, (our cut was made without noticing this omission, until too late to correct,) and crowned with a peculiarly constructed scarlet, orange or yellow flower. The corolla is a dull yellow, but nearly concealed by the larger and more numerous colored floral bracts (leaves) which give form and expression to the flower. The leaves along the upper portion of the stalk are often colored at the apex, (scarlet or orange,) while the bracts of the head are usually green at the base.

DURING the past few months we have received from Mrs. C. B. Younger and H. Case, California; John A. Spring, Arizona; Mary Treat and A. H. Curtiss, Florida; Joseph Allen, Australia; B. E. Deely, Michigan; Julia A. Miller, Texas; Mrs. S. M. Thomas, Kansas, plants, and seeds of rare and valuable plants, for which we wish to return our thanks. Some of the plants are now in the hands of botanists for study, and soon we shall expect a good report from them.

WE wish to call particular attention to the advertisements that appear in this number of the INDEX. They are all representatives of reliable and worthy houses, and can be relied upon for whatever they promise to do. It will be seen that they nearly all have a specialty in their line; and we would suggest that any one wanting a quantity of choice Lilies, would see what they could do with Mr. J. Vander Swaelmen before purchasing elsewhere. Also, for Ferns we would recommend Mr. Merrill, as his is the only establishment of the kind in the country that makes a specialty of Ferns. The same may be said of Messrs. Bush & Son & Meissner, in the way of Grape Vines. In fact, our pages represent only those known to be the best.

AMONG the recent patents issued by the U. S. Patent Office, is one to A. Stoner, of Stony Point, La., that promises to be of great value to our friends in the Southern States. It is a machine for removing the fleshy portion of the leaf of the *Yucca*, and cleaning the fiber contained in the leaf for mercantile purposes, without rotting or in any manner impairing the strength of the fiber.

CORRESPONDENCE

[We solicit the privilege of publishing extracts from correspondence, of interest to the general reader.]

San Francisco, Cal., April 20, 1878.

L. B. Case.—*Dear Sir:* I noticed, in the April No. of your Botanical Index, an article upon the double flowering *Calla Lily*. About one year ago I possessed a flower similar to the one described in the Index. The flower was an object of great interest, although no one could account for the singular development. The plant never before, nor has it since, produced a similar flower. I am unable to give any information upon the subject, but simply write in compliance with your request, that you may know that a similar development has before occurred with the *Calla Lily*.

Respectfully, F. G. M.

Bradford, Vt., April 22, 1878.

L. B. Case: In your Index for April I find the cut of a double *Calla*, which is an exact representation of one that I had blossom in the winter of 1873. * * * My plant was kept in a room that was not very warm, and the bud was a long time in coming to maturity. My plant is very floriferous, but it has never produced but one double flower, and none of the bulbs off that have ever had anything but single flowers.

Yours, truly, J. T. W.

Coldwater, Mich., April 25, 1878.

Mr. L. B. Case: Saw No. 5 of your Index, with an engraving and description of a double *Calla* flower. Had one to blossom the same last spring, being the sixth blossom of the season. This year the flowers have all been single, as formerly; shall look for another double one when the center throws up its buds.

Mrs. F. A. S.

Oswego Greenhouses, Oswego, N. Y., April 17, 1878.

Dear Sir: Regarding the curious double form of *Richardia Ethiopica* mentioned in your Index, it has occurred *twice* with me this winter. I grow about 400 *Callas* for winter bloom. Respectfully, yours, W. N. Mattoon.

Sandusky, O., April 17, 1878.

Mr. L. B. Case.—*Sir:* * * * * Received the Index last evening. I have a double flowering *Calla Lily*, but it has not bloomed this year.

Respectfully, Mrs. A. H. B.

Mount Victory, O., May 14, 1878.

L. B. Case.—*Dear Sir:* * * * Year before last, I had a double flowering *Calla*, which bloomed double for two years, the petals being opposite. I sent it to Peter Henderson, but not proving just what he wanted he returned it to me, and on the way back it got frozen. However, I saved a small offset, which will probably bloom this year; if so, will let you know the result.

Respectfully, W. C. H.

[We give on this page the result of the correspondence in reference to the article on *Richardia Africana flore pleno*, page 62 in April number of Index, and wish to return thanks to our friends for the interest shown in the subject. It will be seen there have been a few abnormal forms noticed before, but they are quite rare. One fact may be considered as established, and that is, that a *Richardia* blooming double once must not be considered sure to produce a second double flower. However, we would suggest to those growing them that by fertilizing a double flower they may succeed in obtaining from the seed a plant that will be more likely to prove a constant double bloomer.—Ed.]

MILTON, IND., May 2, 1878.

L. B. CASE.—*Dear Sir:* * * * *Callas* cannot fail to be in nice thrifty condition, and bloom well, if these directions are followed: Take a 6 or 8 inch pot; place a piece of crock over the hole in the bottom; put in about $1\frac{1}{2}$ inches of fine gravel, and on that put about one inch of dirt; then place your *Calla* in, and fill around with gravel; let it be coarser as it fills up on the top, it ought to be as large as marbles; do not get it too coarse, about the middle—about such as is on the side-walks; place pretty large stones on top; water freely, and your *Callas* cannot fail to grow fast and have a much better color than those grown in dirt. My *Callas* are very nice now. I recommend this to all who have them, and are growing them in dirt altogether.

Very truly, G. M.

TOMAH, WIS., April 18, 1878.

MR. CASE.—*Sir:* I will give you my experience with *Richardia.* I have a plant from which there has been cut (within six months) seven blossoms. There are two buds in sight, and two more that will be out in a short time I will give you the dimensions of one leaf and stock, also of bud and stock. From base of stock to end of leaf, 50 inches; breadth of leaf, 14 inches. From base of bud stock to end of bud, 44 inches; will be at least 48 inches when bud opens. I have a *Begonia Argyrostigma*, which I bought of you, that is sending up a shoot that is now 39 inches in height and $1\frac{1}{2}$ in circumference; it is about six weeks since it first made its appearance. I have also a *Geranium*, (*Master Christine*,) that has a truss of blossoms 13 inches in circumference.

Respectfully, J. T. B.

GENTBRUGGE-GHENT, BELGIUM, June 8, 1878.

L. B. CASE, Esq., Richmond, Ind.

Dear Sir: I think the general prospect for the autumn exportation of *Lilies*, and other bulbs and plants, will be very good this year, because the weather is very favorable here and promises to give brilliant results. Many thousands of the splendid *Lilium lancifolium album*, *roseum*, *rubrum*, *punctatum*, etc., will give, without doubt, stems with 15 to 20 flowers, and perfume the air with its agreeable fragrance at a long distance. *Lilium auratum* (the King of the Lilies) is growing here also in extensive quantities; stems from 4 to 6 feet in height, are showing already from 6 to 20 flowering buds. *Lilium longiflorum*, from China, is growing here for the millions, and the very cheap prices permit it to every one and make them popular. Also, the handsome *Lilium candidum*, the favorite of young ladies, is largely represented. *Lilium Szowitzianum*, the finest flavored species of the genus, originally from the Caucasus, the fine bell-shaped, citron-yellow flowers are remarkably beautiful and fragrant, and cannot be too highly recommended for pot-culture; many thousands may be had here. Also, the other fragrant and early flowering Turk's-cap species, *L. carniolicum*, orange passing to scarlet, and *L. pomponium rubrum* and *luteum*, and *L. pyramidum.* The *Lilium tenuifolium* is an extremely beautiful miniature, bright scarlet; also, the rare scarlet *Lilium callosum*, miniature, from Japan. *Lilium bulbiferum*, this old species but always rare, is native of central Europe—the flowers are erect and orange color, and produce numerous green bulblets in the leaf-axils; in the past year I have been fortunate in introducing a large stock. *L. umbellatum atrosanguineum*, *incomparabile*, etc., are perfectly decorative for beds and borders; six thousand are blooming here annually. The old and well known *L. tigrinum* is very floriferous and splendid for decorative purposes, and recommendable for pot-culture; about ten thousand are yearly exported at the low rate of $2.00 per 100. *L. tigrinum splendens*, handsome variety; exportations 1,000 per year. *L. tigrinum Fortunei flore pleno*, this noble lily introduced from Japan, is extremely recommendable; the flowers are as double as possible. The gigantic and majestic *L. giganteum* attains here from 7 to 10 feet in height, bearing from 10 to 20 large, trumpet-shaped, pendulous flowers. The noble *L. Browni* produce ordinarily one or two flowers to a stem, and I am very glad to tell you I have many others showing three large flowers. *L. Hansoni*, (new species), introduced by Dr. Hogg from Japan, is a very good grower and quite hardy; I have some strong plants attaining 5 feet in height, with 10 to 20 handsome bright yellow flowers to a stem, freely dotted crimson,—this grand species will be a valuable acquisition. The varieties of *L. Thunbergianum* are almost endless and too much similar; I cultivate only the best and the most distinct varieties, such as: The true dwarf, *L. Thunbergianum atrosanguineum*, *L. Thunbergianum atrosanguineum grandiflorum*, *L. Thunbergianum atrosanguineum maculatum*, *L. Thunbergianum aurantiacum multiflorum* (*biligulatum*), *L. Thunberg. aureum nigro-maculatum*, *L. Thunberg. Prince d'Orange*, and *L. Thunberg. venustum.* The beautiful American Lilies, *L. pardalinum*, *L. Canadense flavum*, *L. superbum*, *L. Columbianum*, *L. parvum*, etc., grow here admirably in leaf-mould and plenty of peat; they are also largely represented. The truly noble *L. Humboldti* and *L. Washingtonicum* grow well and flower well in shady situations. The conspicuous *L. Philadelphiacum* and the pretty *L. Catesbæi* are bad growers here, the bulbs are frequently diseased. *L. Chalcedonicum*, from Asia, and the true *L. Dahuricum*, *L. excelsum*, (*testaceum*,) the varieties of *L. candidum*, and varieties of *L. longiflorum*, grow very well, as well as *L. martagon*, from central Europe, and *L. martagon flore albo*, with 24 flowers to a stem. *L. martagon Dalmaticum*, the black Turk's-cap Lily, from Montenegro, is a brilliant rare species giving frequently 15 to 30 flowers to a stem; the color is purple-black, very distinct. *L. Leichtlini*, very fine species, native of Japan, large flowers, citron-yellow, spotted brown. *L. Neilgherrense*, from the mountains of peninsular India, is one of the most valuable lilies, the extremely large trumpet-shaped flowers make it strikingly effective; deliciously fragrant. *L. Krameri* grows very well here in shady, sheltered situations; the flowers are very handsome and sweet-scented; colors of all tints, deep pink, delicate pink, to pure white. At last I can say to you with great pleasure that next autumn I hope to introduce a few bulbs of the new *Lilium Parryi*, not yet in cultivation; this gorgeous species is allied to *L. Washingtonicum*, but the flowers are yellow, very handsome, attaining from 3 to 6 feet high; discovered by Dr. Parry in Southern California, in bogs at an elevation of 7000 feet. *Lily of the Valley*, the best known and most universally admired spring flowering plant, grows here extremely well. The grand snow-white flowered *Czackia liliastrum*, (St. Bruno's Lily,) is one of the first spring flowering lilies in cultivation, and is very pretty and graceful.

Funkias, with variegated leaves, grow extremely well here; some clumps are from 1 foot to 1½ feet across. The *Funkias* are most valuable for decorative purposes. *Christmas Rose* (*Helleborus niger*) is one of the most valuable acquisitions to the winter garden and Christmas days. I make yearly immense exportations of them to the United Kingdom and to America. I have about fifteen other varieties and species of *Helleborus* in my gardens. *Hepaticas*, with flowering crowns, for the million. This charming and effective winter flowering plant is worthy of an illustration in your Index. The flowers are single and double, and are blue, purple, rose, red, white, lilac, etc., and give a succession of blooms from January until March. The exports from here of *Spiræa (Astilbe-Hoteia) Japonica*, in clumps for forcing, attains to an incredible magnitude. The growers are numerous, and every countryman cultivates them in connection with potatoes and corn. The general annual exportation from the Belgium nurserymen is about 500,000 clumps. Also, the *Azalea Indica*, *Azalea Mollis*, *Hardy Ghent Azaleas*, *Camellias*, *Rhododendrons*, etc., are exported yearly by the millions to all parts of the world. The *Palms*, and stove and greenhouse plants, are also specialties of the Belgium nurserymen. I have about 100,000 young specimen *Palms*, (seedlings,) in store pots and small single pots, amongst all the best kinds, extremely healthy, suitable for export, and at very low rates. *Amaryllis*, *Begonias*, *Gladiolus*, *Hyacinths*, *Tulips*, etc., are also largely cultivated here.

Hoping, dear sir, the above report will be acceptable to you, I remain,

Yours, truly,

J. Vander Swaelmen.

The following extract from a private letter received a short time since from a resident, for the past five years, of San Diego county, California, will convey some idea of the effects of the terrible drouth (just terminated) that has visited that region of country for the past few years:

San Diego, Cal., Jan. 13, 1878.

"* * * We are having some fine rains this winter, and the flowers are now beginning to bloom; but last year was a terribly dry one. It will take a few years of good crops for people to make up the losses of the year just passed. * * * About one-half the (honey) bees have died, and the rest are nearly starved out. There was not a pound of surplus honey made in this part of the county last year, nor indeed anything raised to speak of. Stock suffered terribly, and a great many died for want of water; those that survived are now in very poor condition. But the people managed to live through, and are in hopes of better times in the future. * * * There were no seed on anything here last year—hardly anything bloomed; and that which did bloom was blasted by the hot winds before it ripened. The only chance for seed this spring will be old seed, if it could be got. Yucca did not bloom at all last year."

H. C.

L. B. CASE'S

PRICE-LIST OF PLANTS.

[We are now prepared to furnish large specimens of nearly all kinds of Decorative Plants desired. Shall be pleased to furnish special price of anything wanted.]

LAWN AND CONSERVATORY PLANTS.

	Each.
Abelia Rupestris	$0 35
Abutilon Boule de Niege	35
“ Thompsoni	25
Acacias, six varieties	50
Acalypha tricolor	30
Achæna malvaviscus	25
Alamanda cathartica	50
Aloysia citriodora (Lemon Verbena)	25
Anthurium glaucesens	1 00
“ Lindenii	3 00
“ magnificum	2 00
“ regale	3 00
“ Scherzerianum	3 00
Bambusa Fortunii variegata	35
“ Simonsii folius var.	50
Bohemeria argentea	25
Brahea filimentosa, (Palm)	2 00
Carludovica palmata, (Palm)	1 00
Caryota urens, (Palm)	1 00
Chemærops humilis, (Palm)	1 00
Citrus aurantica, (Orange)	1 00
“ myrtifolia	2 00
“ Otaheita, (Dwarf)	50
Chamædorea maritima, (Palm)	2 00
Clerodendron Belfouri	25
“ Bungeii	25
“ fragrans	25
Cocolobia platyclade	25
Crape Myrtle, (Lagerstrœma)	50
Cupressus pyramidalis	30
Curculigo recurvata	50
“ “ var.	2 00
Deeringia Amhersti variegata	25
Dracæna Australis	25
“ Braziliensis	30
“ congesta	25
“ Draco, (large)	10 00
“ fragrans	50
“ ferrea	50
“ Haageana	75
“ odorata	50
“ terminalis	75
Eranthemum elegans, (white and pink)	30
Eranthemum pulchellum (blue)	20
“ tuberculatum (white)	30
Erianthus Ravenæ, (Pampas Grass)	40
Erythrina Caffra	2 00
Euonymus argenteus	25
“ aurea marginata	25
“ “ variegata	50
“ radicans var.	25
“ tricolor	50

	Each.
Euphorbia Brionii	$0 50
“ Jacquiniflora	25
“ pendula	20
“ spinosa	50
“ splendens	50
“ sanguinea	50
Ficus Australis	50
“ carica, (Fig)	50
“ elastica	75
Ficus japonica, (creeping)	20
“ mocrocarpa	1 50
“ nitida	40
“ Parcellii	1 50
“ repens, (creeping)	20
Hedera helix, (English Ivy)	25
“ “ marmorata	50
“ Hibernica, (Irish Ivy)	25
“ “ aurea maculata	50
“ “ marginata arg.	50
“ versicolor	35
“ digitata	30
“ Regneriana (Japan Ivy)	20
“ (Russian Ivy)	20
Hibiscus sinensis carminatus perfectus	50
Hibiscus sinensis conspicua	30
“ “ Cooperii tricolor	30
“ “ cruentus	50
“ “ double orange	50
“ “ “ salmon	50
“ “ “ yellow	50
“ “ fulgidus	35
“ “ grandiflorus	50
“ “ miniatus	50
“ “ metalicus	50
“ “ single red	25
“ “ “ rose	50
Hoya belle, (Dwarf Wax Plant)	50
“ carnosa, (Wax Plant)	25
“ “ variegata	50
“ Cunninghami	30
Hydrangea Hortensis	35
“ paniculata grandifl.	40
“ rosea alba	25
“ Thos. Hogg	50
Japan Plum	25
Jasminum odoratissima	25
“ revolutum	25
Ledenbergia rosæ-ænea	25
Myrtus communis	50
Olea Americana	50
“ fragrans	50
Oleander album	30
“ flavum duplex	50
“ Prof. Durand	50

	Each.
Oleander Giant des Battles	$0 50
" Madonna grandifl.	50
" rosea	30
" splendens	30
" Such's New Double White	1 00
Pandanus gramnifol., (grass like)	50
" Veitchii	2 00
Philodendron pertusum	1 00
" princeps	1 00
" Lindenii	2 00
Phromium tenax, (New Zealand Flax)	50
Piper Nigrum, (Black Pepper)...	35
Plumbago capensis ((azure blue)	25
" larpentæ, (indigo blue)	20
" rosea, (rose color)	40
" zeylanica, (white) ...	25
Pothos longifolium	75
" microphylla,	1 00

	Each.
Punica granatum (single Pomegranate)	50
Punica granatum alba-plena..	50
" " rubra-plena	50
" " James Vick	50
Puya Altenstenii	50
" recurvata	50
Sabal serrulata	1 00
Sanseviera Guineensis	1 00
" Javanica	50
Sanseviera Zeylanica	1 00
Sanchezia nobilis variegata ...	25
Scindapsus pictus	50
Urtica macrophylla	50
Yucca aloefolia	25
" baccata	50
" pendula	50
" gloriosa	25
" " variegata	2 00

BULBOUS ROOTED PLANTS.

	Each.
Agapanthus umbellatus	$0 75
Aloecasia odorata	1 00
Amaryllis atamasco	25
" aulica	1 00
" formosissima	35
" Johnsoni	1 00
" lutea	20
" Prince of Orange	1 00
" Regina	1 00
" rosea	75
" Treatii	25
Caladium albo nervium	40
" Alphonse Karr	75
" Beethoven	1 00
" Brougniartii	75
" Duc de Ratibo	1 00
" Max Kolb	75
" Pœcille	75
" Sedenii	1 00
" Wighti	75
Canna, 10 varieties, light & dark	25
Colocasia atropurpurea	75
" Bataviensis	40
" esculentum	40
" Javanicum	75

	Each.
Convolvulus palmata	25
Crinum amabile	$5 00
" Americana	50
Eucharis Amazonica	75
Imatophyllum grandiflorum...	1 50
Musa Cavendishi, (Banana)	3 00
" paradisica, (Plantain)	2 00
" rosacea, (Chinensis)	1 00
" sapientum, (Banana)	2 00
" zebrina	5 00
Oxalis alba, (white)	15
" Bowieii, (pink)	25
" Ortgiesi, (yellow)	25
" rosea, (rose color)	25
" versicolor, (white, crim.)	15
" violacea. (violet-purple)	15
Pancratium fragrans	2 00
" grandiflorum	2 00
" rotatum	2 00
Richardia Africana, (Calla)	35
" hestata variegata ..	25
" alba maculosa	25
Tritoma uvaria	25
Tritonia aurea	25
Tuberose, (in pots)	30

SUCCULENT PLANTS.

	Each.
Agave Americana	$0 25
" " variegata...	50
" Sislandi	50
Aloe alba picta	30
" aspersa	50
Cooperi	1 00
" latifolia	1 00
" lingua	50
" Margaritifera	50
" serratifolia	25
" soccatrina obliqua	40
" " umbellata	30
" verrucosa	30
Bryophyllum calycenum	25
" petiliana	25
Cacalia articulata	25
" glauca	25

	Each.
Cactus, great variety, from 25c. to	$10 00
Cotyledon arborescens	15
" orbiculata	25
" coruscans	15
Colletia Bictoniensis	25
Crassula arborescens	15
" ciliata	15
" gracilis	15
" lactea	25
Echivera atro purpurea	15
" grandiflora	25
" metalica	50
" pulverulenta	35
" retusa	25
" " floribunda	25
" rotundifolia	25
" sanguinea	15

	Each.
Echivera secunda	$0 15
" " glauca	30
Epiphyllum, 4 varieties	25
Hechtea Ghiesbreghtii	50
Mesembryanthemum (Ice Plant) 8 varieties	15
Pachyphytum bracteosum	25
" Hookeri	25
Pedilanthus tithyroloides	25
Rochea falcata	25
Sedums, in great variety	15
Sempervivum arvernense	25

	Each.
Sempervivum Californicum—(Calcareum)	$0 25
Senecio pentasitus	25
" calamiforme (calamifolius)	30
Stapelia asterias, (erect)	50
" deflexa (trailing)	20
" grandiflora, (erect)	50
" mixta, (erect)	30
" normalis, (trailing)	20
" serpentina, (trailing)	20
" Woodfordiana, (trailing)	20

NEW PLANTS FOR FLORISTS' STOCK.

Coleus Eldorado	$0 25
" multicolor	25
" pictus	25
Gesnaria Jasmineflora	50
Fuchsia procumbens	25
" racemosa	50

Iris Japonica	$0 25
" hexagona	25
Russelia floribunda	25
Torrenia Fortuni	25
Violets, good varieties	20
Sarracenia variolaris	50

AQUATIC PLANTS.

Amorphophallus Rivierii, 75c.
Caladiums, in variety, 30c.
Cyperus alternifolius, 25c.
" " *variegata*, 50c.
Nelumbium speciosum, (*Lotus*,) $2.00.
Neuphar odorata, (hardy,) 50c.
Nymphea flava and *odorata*, $1.00.

Papyrus antiquorum, $1.00.
Pontideria cordata, (hardy,) 30c.
Richardia Africana, (*Calla*,) 25c. to 75c.
" *hestata variegata*, 25c.
" *alba maculata*, 25c.
Sagittaria, in variety, (hardy,) 25c.
Typha, Cat-tail Flag, (hardy,) 25c.

RECENT PUBLICATIONS.

[We shall be pleased to receive from authors and publishers, copies of botanical books, papers, and prospectuses, for a notice in this column.]

In the list of new books we must first notice Prof. Gray's "Synoptical Flora of North America." (Cambridge, Mass. Price, $6.) Part I, vol. II. A continuation of Torrey & Gray's "Flora of North America," which stopped at the end of the order *Compositæ*. The work will be completed in two volumes of about 1200 pages each. Also, "Bibliographical Index to North American Botany." (S. Watson, Smithsonian Miscellaneous Collection. Washington, D. C., 1878. Price, $2,25.) Part I. *Polypetalæ*. These works are indispensable to any one studying botany.

"Ferns of Kentucky." (John Williamson, Louisville, Ky. $2.) Now ready for distribution, and is one of the choicest books of the year. Illustrated with 60 full page etchings and 6 wood-cuts. The letterpress is excellent, and as the book is interleaved with blank leaves, it will serve an excellent use as a field-book.

"Ferns of North America." Parts IV and V. (Prof. Daniel Eaton. Published by S. Cassino, Salem, Mass. $1 each number.) Contains beautiful colored lithographs, true to nature, of some of the rarest species of North American Ferns, that most of us will probably never have a chance to see.

"List of Native and Exotic Ferns in the Greenhouses and Grounds of J. Warren Merrill, Cambridgeport, Mass." This is a catalogue of Ferns collected during the past eight years, as an amusement and pastime, by an invalid, (Mr. Merrill); but the quantity has increased to such an extent that he has been forced to put a portion on sale. The collection is the most complete of any in the country. See his advertisement in this number.

"Catalogue of Plants of Jefferson County, Ind., by Chas. R. Barnes, and of Clark County, Ind., by John F. Baird," is the result of patient study and careful searching in a very pleasant task, and we only wish more counties would produce as energetic and ambitious botanists. The list should be in every library, as a reference to local botany nowhere else to be obtained.

Next in point of interest to a choice book is a good magazine or paper, and the "Botanical Gazette, the Bulletin of the Torrey Botanical Club," fills the bill in a scientific botanical sense exactly; but as they are strictly scientific, perhaps the general reader would not be as well pleased with them as if the subjects were more varied. If so, the late botanical articles in "Silliman's Journal of Science and Arts," "The American Naturalist," or "The Transactions of the St. Louis Academy of Science," would be of special interest.

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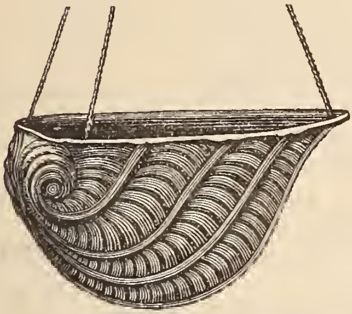

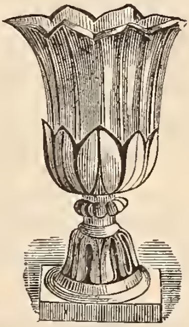

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BOTANICAL INDEX

TO THE

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TORREY BOTANICAL CLUB. NEW YORK

VOL. 1.—No. 7. OCTOBER, 1878. Published Quarterly, at 25 Cents a Year.

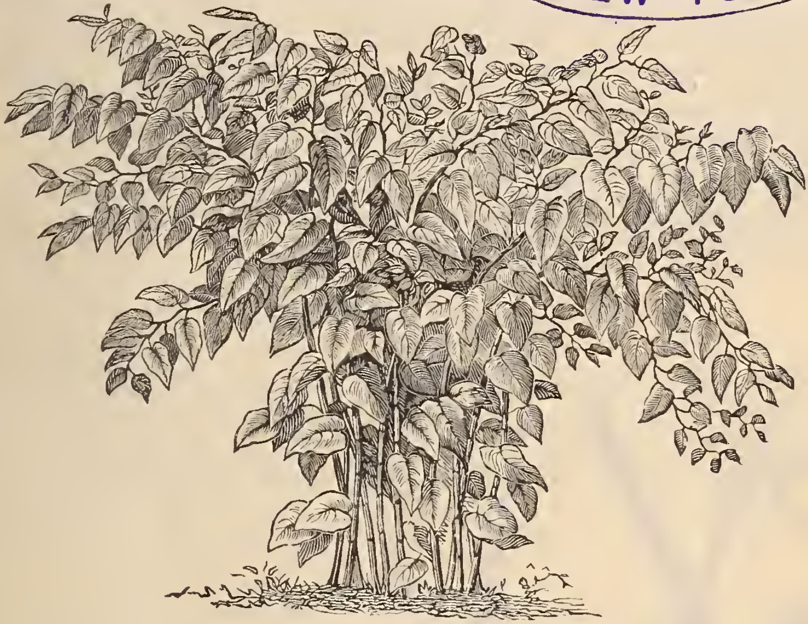


FIG. 54.—*Polygonum Sieboldi.*

AUTUMN WORK.

WITH the return of cool, invigorating Autumn weather, we really commence a new year,—at least from an agricultural and horticultural point of view—for nature seems to separate the vegetable year at the close of the hot, dry summer. All our grain, fruit and nuts are then ripe or ripening, and the seed of nearly all the hardy perennials, (including some of the grains), and all the seed of the stone-fruit, as well as hardy bulbs, are far better off in the ground than otherwise; indeed, many things will never germinate unless planted in the fall. But as all successful cultivators are taught by experience this important fact, we will now briefly notice a few things that after a fair trial under cultivation have proved themselves worthy a place in the flower garden.

A bountiful giver has spread broadcast over the face of the earth an almost endless variety of vegetable forms adapted to the wants and requirements of the human family, particularly in the tropical and temperate zones; and from these free gifts we are all privileged to select and gather such as our wants may require or our fancy dictate, if we will only be to the trouble and expense of going where they are found growing wild. If we choose palms, tropical fruits, tropical orchids, etc., we must go to the tropics to find them in all their native luxuriance; but if we will content ourselves with such as are adapted to our latitude and are within our immediate reach, we need only take an occasional excursion to some of our forests, swamps, prairies, etc., and there find many a lovely and often strange form of some of our native plants that will wonderfully repay the trouble of cultivation, especially if we choose the bulbous or tuberous rooted plants; for it must be borne in mind that nearly all our magnificent flowering hardy plants were originally only common, unpretentious, and often insignificant, previous to their present high state of cultivation.

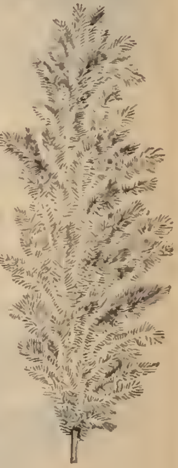


FIG. 55.

Among the number especially attractive in early Spring is the pretty little "Painted Cup," *Castilleja Coccinea*—Fig. 53, July No. of INDEX—varying in color from yellow to dark orange and often scarlet. Also, the lovely blue-eyed grass, *Sisyrinchium Bermudiana*, Figs. 56 and 57, with its many varying forms, two of which have been named: variety *Anceps* and variety *Mucronatum*. These make an excellent border plant, flowering from the last of May until August, growing in clumps or tufts of from a few grass-like stocks (*culms*) to bunches of one foot in diameter, which, under cultivation, increase in beauty and luxuriance. But for a cool, moist place under the trees, where no other variety of plants seem to thrive, we find nothing more at home than a selection of our native Orchids. First and commonest is the Lady Slipper, *Cypripedium spectabile* and *C. parviflorum*, while some of the four other native species can be added to the collection by a little careful botanizing. The grass pink, *Calopogon pulchellus*, with its large, fragrant, pink flowers, produced in July, should be planted near together, as they occupy so little room and make the most showy beds of all the native Orchids. The fragrant white-fringed Orchis, *Habenaria blephariglottis*, and the ragged white-fringed Orchis, *H. lacera*, also very fragrant, and blooming in July, are two of the strangest of flowers, being pure white, in a large spike of from ten to fifteen flowers and about 14 inches high. But the yellow-fringed Orchis, *Habenaria ciliaris*, in our experience is far the most profuse bloomer, and having more foliage than most of the other Orchids, makes rather more show. The flower-spike is oblong like the head of the Hyacinth in outline, and the flowers are rather closely set; of a bright orange-yellow, conspicuously fringed, usually growing about 15 inches high, and blooming in July and August. Prof. Gray says, "Our handsomest species," and he certainly knows. But as there are over fifty species of native Orchids, hardy north of 40° latitude, the space allowed for this article will not admit of a reference to all the species; suffice it to say, no one will tire of collecting and cultivating species and varieties of this strange family of plants, after once becoming interested in their culture. All the varieties grow in a moist (usually wet) peaty ground, often in the shade of trees or bushes, and are more or less abundant throughout all the Northern States, and can be obtained in almost any quantity. But as they are usually an almost leafless plant, they are not easily identified except while in bloom, for which reason it is advisable to take them up with a quantity of soil attached to the roots undisturbed, to prevent their wilting. By this means we find no difficulty in removing them during July and August, and would recommend that time as a proper one, if they can be replanted within the next day or two.

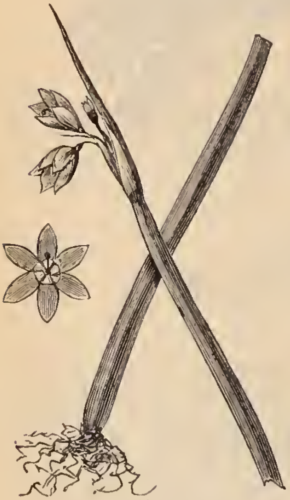


FIG. 56.

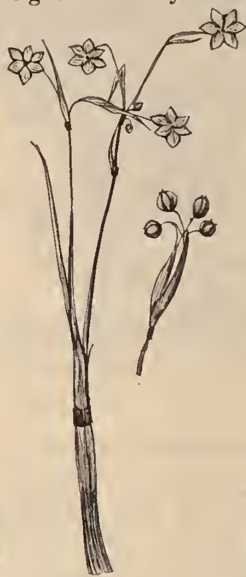


FIG. 57.

There is still a long list of choice flowering native plants that would well repay the trouble of cultivation, and are really desirable; indeed, no one need fear wasting their time devoted to collecting and cultivating a large number of our native plants. Especially would we recommend Columbine, Phlox, Pentstemon, Blazing Star, Blue

Corn Flower, Harebell, Sweet-William, Lobelia, Stevia, Eupatorium, Stellaria, etc. All these, and a great many other varieties of native plants which are more or less abundant throughout the country, can be collected by any one by a careful search, especially upon uncultivated land; but you will never be fortunate enough to find them all growing together.

In the list of introduced (foreign) hardy plants and shrubs, probably nothing is more effective than the so-called Pampas Grass, standing in a *clump* on the lawn. But our experience is that *Saccharum Maddeni*, (Fig. 68, p. 107,) being the most hardy is the most desirable for this latitude. It requires no protection during winter, and if left undisturbed for a few years will attain a dense, gigantic size. Of course the plumes will not compare with those from California, (Fig. 55,) but as they add such a tropical aspect to the lawn during the last of summer, they are almost indispensable. Next to the Pampas Grass, we think *Polygonum Sieboldi*, from Japan, (Fig. 54,) should have a "reward of merit," for it is certainly one of our most meritorious plants. It dies down to the ground each Fall, but in the Spring starts early and grows rapidly, attaining a height of 4 or 5 feet by the middle of August, when it commences to throw out its innumerable racemes of white flowers among the thick-set, large, heart-shaped or oval leaves, and remains in perfection until frost. Like all other tall-growing, hardy herbaceous plants, the roots spread quite extensively, for which reason they should be planted where they can form a large clump. The list of hardy herbaceous plants worthy a place in each collection is a very long one, and we can only refer to the more effective in this place.

But we cannot close this article without a word in reference to our locality, for our friends in the Southern States and California must keep in mind that we live in a cold climate, where the word *Winter* does not mean *continuous rains*, as it does in all warm latitudes, but indicates a cold and dreary season of snow and ice, with the ground often frozen three feet deep for weeks together. Consequently, we must content ourselves with rather unpretentious hardy plants and shrubs, while many of our readers are enjoying the delightful fragrance of the Tea Rose, Gardenia, Pittosporum, Jasmine, etc., as well as the still richer perfumes from the flowers of sub-tropical fruit trees, standing in the open ground and vieing with each other in their efforts to make Winter the loveliest portion of the year.

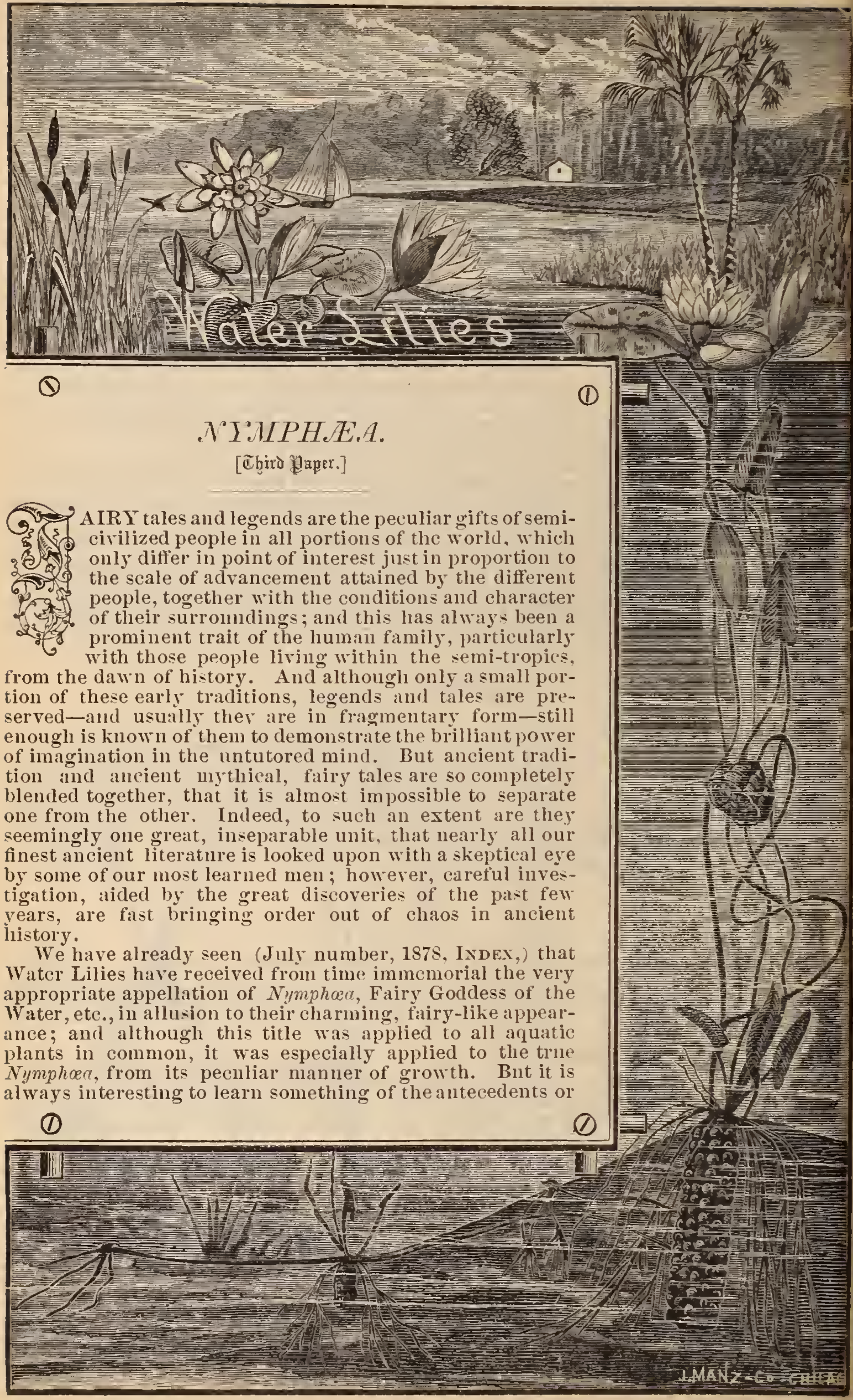
IT seems that many do not understand that the object of what is termed "protection" to plants, is not to keep them warm. It is rather to keep them cold, though not for that either. It is to protect them against the wind, the sun, and sudden changes of temperature. There is nothing better than evergreen boughs; but when these are not easily obtainable, long manure thrown lightly over the beds and held there by sticks stuck diagonally, or any light substance, will answer just as well. —*Moore's Rural New Yorker, Sept. 28th.*

[From Scraps and Queries Department of Gardeners' Monthly, for Sept.]

* * * I send you by this mail a double *Lilium candidum*, which has appeared in my *candidum* bed. * * * * The plant is vigorous, and there are ten double flowers on the spikes. N. W. M.

This is a very interesting freak. It is not double in the usual sense of double flowers, but a simple mass of white leaves terminating the stalk, the leaves scattered closely along about one inch of stalk. And yet it shows how closely leaves and flowers are allied in nature, when leaves can be made to look like white petals.—*Ed. Gardeners' Monthly.*

WITH this number we close Vol. 1 of the BOTANICAL INDEX, and January 1, 1878, we shall commence Vol. 2, which we hope to improve and make as attractive as possible. We propose to continue giving full illustrations of all the subjects referred to, as heretofore, because good pictures will convey a better idea of any subject than words can do. The subscription price will remain at twenty-five cents a year, which, however, does not begin to pay the cost of publishing, unless we can secure a large subscription list; and we hope all our friends, who have the good wishes of our success at heart, will encourage us in a substantial manner.



NYMPHÆA.

[Third Paper.]

FAIRY tales and legends are the peculiar gifts of semi-civilized people in all portions of the world, which only differ in point of interest just in proportion to the scale of advancement attained by the different people, together with the conditions and character of their surroundings; and this has always been a prominent trait of the human family, particularly with those people living within the semi-tropics, from the dawn of history. And although only a small portion of these early traditions, legends and tales are preserved—and usually they are in fragmentary form—still enough is known of them to demonstrate the brilliant power of imagination in the untutored mind. But ancient tradition and ancient mythical, fairy tales are so completely blended together, that it is almost impossible to separate one from the other. Indeed, to such an extent are they seemingly one great, inseparable unit, that nearly all our finest ancient literature is looked upon with a skeptical eye by some of our most learned men; however, careful investigation, aided by the great discoveries of the past few years, are fast bringing order out of chaos in ancient history.

We have already seen (July number, 1878, INDEX,) that Water Lilies have received from time immemorial the very appropriate appellation of *Nymphœa*, Fairy Goddess of the Water, etc., in allusion to their charming, fairy-like appearance; and although this title was applied to all aquatic plants in common, it was especially applied to the true *Nymphœa*, from its peculiar manner of growth. But it is always interesting to learn something of the antecedents or

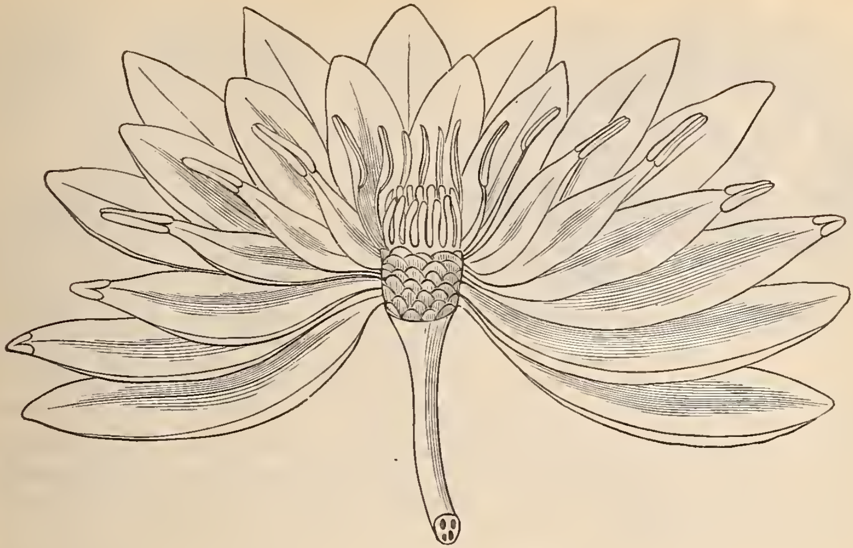


FIG. 59.

genealogy, if you please, of any strange or mystical object first, and we will turn to ancient mythology to learn something of these supposed fairy deities. Ancient mythology, however, is often very indefinite in its delineation of the origin and attributes of some of the fabled deities; or perhaps more properly speaking, the old Greeks and Romans have often adopted the oriental and African mythology without a full understanding of their supposed attributes, for in all probability the origin of these pleasing tales was Asia or Africa, (Egypt).

We find at the head of mythical genealogy stands Chaos, with her four children; next in succession is Earth, first-born of Chaos, also with her four children; then Earth married to Heaven raised a family of seventeen children, whose oldest and most beloved son, Oceanos, takes Tethys, one of the Titans, for his bride, and of their three thousand daughters (viz., all the lakes, rivers and brooks known to the ancients,) Oceanides marrying Jupiter raised a family of fifty daughters—the Nymphs—who were the titular goddesses or guardians of the sea, lakes, rivers, mountains, dales, groves; in fact, every place known to the ancients was fabled to have one of these fairy Nymphs as their protector, with appropriate titles, to which was dedicated suitable rites and ceremonies for their worship. The *Naiad Nymphs* were the particular guardians of fresh water, rivers, etc., and as such, are the special objects of our notice.

"The word *Nymphœa* seems to have originally signified "bride," and was probably derived from the Greek verb "to cover," or "veil," which was akin to the Latin words *nubo* and *nubes*. It was generally applied to married or marriageable young ladies, for the idea of youth was always included. It was in this last sense that the goddess of whom we have been treating was called Nymph. *(Anthon's Classical Dictionary.)* They were not considered immortal, but often perished with the object of their care. The demi-gods and heroes of antiquity were fabled to have been nourished by them, and many wise men to have been inspired and instructed by them; in general they watched with solicitude over the fall of mortals. They participated in the councils of the gods on Olympia, and often appeared in their company. The Naiads are usually represented in works of art as beautiful young maidens, half draped and with long flowing hair, usually leaning upon an urn from which flows a stream of water. The word "Naiad" is derived from the Greek verb "to flow," as indicative of the general motion of the water. They were supposed to preside over fresh water fountains, streams, brooks and springs, and to inspire those who drank of its waters with oracular powers and the gift of poetry. They could also restore the sick to health. *(Ancient Mythology.)*"

Of course, all these mythical, fairy tales have a direct bearing upon the religious ideas—or perhaps we should say, the superstitious belief—of the people; for there is nothing at that early date, outside of the Jewish church, that is now recognized as religion. And although we affect to despise these old heathen fables, we still retain their names; and these names alone seem to connect the obscure, fabled past with

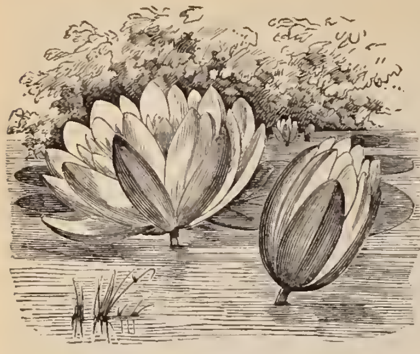


FIG. 60.—*Nymphœa Odorata.*

the present time to such an extent, that for a perfect understanding of the subject we must give more detail than to simply say, "a Greek or Roman legend." This being our apology for deviating from the proposed subject, we will now dismiss ancient mythology, and talk of modern reality.

In all the tropical and temperate portions of the world, particularly in the northern hemisphere, is found a peculiar aquatic plant, with large roundish or peltate leaves that float upon the surface of the water, which are among the loveliest products of the floral world. They are, however, by no means new to travelers or even to science, and have been so often described that it would be almost useless to repeat a description here. But there are some points of special interest that may not be generally known, that we will notice. We will first give the known species as recorded by Paxton, and others, with their synonyms; also, a column giving their native country, color of flowers, and date of discovery, while the last column but one contains the letters, "H." for hardy, "T." for tropical, and "S. T." for sub-tropical, to serve as a guide to cultivators living between 35° and 48° north latitude, in America; but in Europe, as the isothermal line is nearly 10° further north, it would probably be from about 45° to nearly 60° north latitude.

Species.	*Synonyms.*	*Habitat.*	*Color of Fl.*		*Dis.*
Alba		North. and Central Europe	White,	H.	......
Alba Cauadensis		Canada	White	H.	1820
Amazonica	N. blanda, fœtida and Lotus, in part	Jamaica	Yel. gr.	T.	1853
Ampla	Castalia ampla, N. Rudgeana	Jamaica	White	T.	1801
Blauda		Trinidad	White	T.	1820
Cærulea	N. stellata, N. Cyanea, in part	Egypt	Blue	T.	1792
Cyanea	N. cahlara	East Indies	Blue	T.	1809
Deutata		Sierra Leone	White	T.	......
Devoniensis		Florist Hybrid	Rose	T.	1848
Edulis	N. esculenta, Castalia edulis	East Indies	White	T.	......
Elegans		Mexico	Wh. blue.	T.	1848
Flava	N. lutea	Florida	Yellow	S.T.	1876
Gigantea	Victoria Fitzroya	Australia	Blue	T.	1848
Lotus	Castalia mystica	Egypt	Wh. pink.	T.	1802
Micranthea	M. Guineensis	Gambia	White	T.	1848
Minor	N. odorata, variety minor	North America	White	H.	1812
Nitida		Siberia	White	H.	1803
Odorata		North America	White	H.	1786
Pubescens		East Indies	White	T.	1803
Pygmea		China	White	H.	1805
Reniformis		Carolina	White	T.	1823
Rubra	N. Lotus, in part	East Indies	Red	T.	1803
" var. rosea		East Indies	Pink	T.	1803
Scutifolea	N. cærulea, Lotus Lunan, Castalia scutifolia	Cape of Good Hope	Blue	S.T.	1792
Stellata		East Indies	Blue	T.	1803
Thermalis		Hungary	White	S T.	1800
Tuberosa	N. alba of Nutt, N. reniformis of D. C.	North America	White	H.	1865
Versicolor		Bengal	Pink wh.	T.	1807

This makes twenty-eight accepted species, five of which are found growing within the limits of the United States. To this list we might add the variety with pink flowers, so common through some portions of the Northern States, for it certainly seems quite as distinct as some of the varieties of plants honored with a distinct name; but as competent authority declines to do so, we will only speak of the two forms of one species, in their proper place.

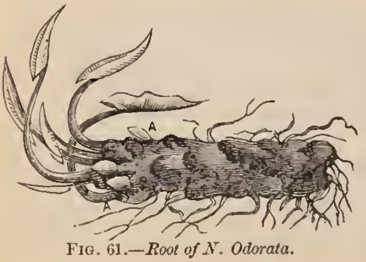


FIG. 61.—*Root of N. Odorata.*

NYMPHÆA FLAVA. LUTREN.

In the picture on page 94, we wish to represent the peculiar manner of growth of *Nymphœa flava*, from Florida, the last addition to the list of *Nymphœa*; and as Mrs. Treat, who re-discovered it, has studied it in its habitat, we will copy her description, as published in Harper's Magazine, for August, 1877. She says:

"The rhizoma is not creeping, as in the white water-lily, but always stands in an upright position, and I have never found it more than a foot

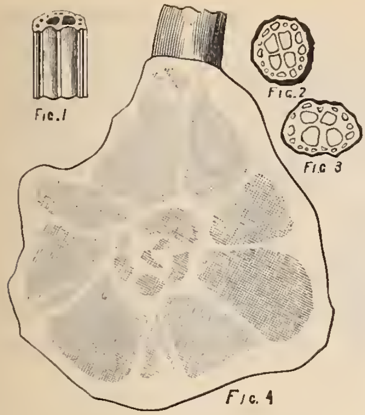


Fig. 62.

in length; the lower part rots away as the plant extends upward. Each year a new circle of leaves starts out above the old ones, the old ones dropping away, leaving the scars on the rhizoma; so, also, a new set of roots starts just beneath the new leaves, the old ones dying away like the leaves. This makes the rhizoma a scarred, straight, underground stem, apparently useless." (See cut, p. 94.) "In the larger plants it is a foot in length and six or eight inches in circumference. After it has done its work of supplying the plant with leaves and roots, this seemingly worthless appendage performs new duties in order to perpetuate its race. It sends out long white runners, often a yard in length, and on the end of each a little plant grows; as soon as this plant is well started, the runner continues and throws out another plant, the same as the strawberry, only this is on a much grander scale. Sometimes as many as four runners are attached to one rhizoma, and three or four small plants strung along each runner. As soon as the new plants become well established, the runner decays, and the little ones are now able to stand by themselves, and each has an independent existence, repeating the history of its parent. But this is not the only way that this lily is perpetuated: it also forms small bulbs or bulblets, which drop into the soft mud and take root. This work is all going on in the Spring, before the plant blossoms. It does not bloom until about the first of May. The flower is like the white pond-lily in form, but the inner surface of the petals is plain yellow, while the outer surface—as we often see in the white lily—is streaked with pink. The upper surface of the new leaves is beautifully variegated with dark purple and light and dark shades of green, and sometimes yellow; the under surface is a deep purplish-red. It grows in water from one to five feet in depth."

In a note from Prof. Sargent, published with the above article, he says: "The authority for the name of *Nymphœa flava* rests on the figure of the white American swan, in Audubon's "Birds of America," in which there is a very good representation of your plant. Under it, it says, '*Nymphœa flava*, Lutren.' There is no description of the flower or any character given, so that *N. flava* has never been published yet. It will, however, be proper to preserve Lutren's name, and he should always stand as authority for the species, whoever may draw up and print the technical description. You know, I dare say, that Lutren was a young German who, years ago, botanized in Florida, and was killed there by the Indians. He probably made notes of his discoveries, but, so far as I know, these have never been published."

Through the courtesy of Mrs. Treat and Prof. A. H. Curtiss, we have some fine specimens growing in our aquarium, and have had the opportunity of studying them under cultivation; and right here we would say, they have proved one of the best, if not *the* best, aquarium plant of anything we have yet seen, and would recommend them as a specially valuable aquarium plant. The leaves are smaller than those of *N. odorata*—being about 5 or 6 inches broad by 6½ to 8 inches long—cordate, with numerous small, sharp angles (repand) in the margin. The flower is very similar to *N. odorata*, except the petals are much narrower, which gives the flower more of a delicate appearance, and with a delicate perfume of the Jasmine or Mirabilis.

NYMPHÆA ODORATA. Aiton.

This is our common American Water-Lily, and is familiar to all. It has large, orbicular, floating leaves, often 6 inches in diameter, attached to the stem at near the center, and cleft from the base to the insertion of the stem. The flowers are white, often shaded more or less with pink, very fragrant, opening with the sun in the morning but closing again about 3 P. M.; about 5½ inches in diameter, more or less double, or petals arranged in fours, in many rows, imbricated so as to cover the whole of the ovary. But of all strange flowers, the *Nymphœas* are the most interesting to botanists, from the fact of its showing the gradual and perfect gradation of forms, from stamens to pistils and thence to sepals. Fig. 59 will illustrate the idea better than words can do it, so we will study the picture. We here give a representation of a flower, with half the petals removed to give a sectional view of its structure. Around the ovary (seed pod) are the perfect stamens, tipped with the yellow anther which gives color to the center of the flower; next are seen broad petal or leaf-like stamens, with the points tipped with a semblance of an anther; while the last of the series is the sepal, green or pink outside but white and petal-like inside. The scars on the ovary show the point of attachment of the petals.

We find under cultivation the flowers usually last two days in perfection, but after the second day the closed flower sinks gradually down in the water (as shown on page 94) and ripens the seed, the decaying petals still adhering to the ovary. The rootstocks of *N. odorata* are long, roundish, and often as large as a man's arm. They are obscurely endogenous—that is, make their growth from the end, as seen in Fig. 61—and lie buried in the mud, with from a few inches of water over them to several feet. Upon cutting the root or leaf-stems they are found to contain a large amount of milky juice, often farinaceous, and are consequently often used for food. Fig. 62 represents at No. 1 a section of the leaf-stem, showing the air canals; No. 2, a cross section of a flower-stem; No. 3, a cross section of a leaf-stem; and No. 4, a cross section of a rootstock, taken fresh from the mud. The flower-stem, in addition to the milky juice contains in the thick outer skin a thick colored juice, which usually gives a pink or purple color to the stem. Although the rootstock is apparently a solid rhizoma, it is found to contain from ten to twenty soft, spongy or porous sections, which serve as the air canals, and correspond to the open air canals in the *Nelumbium.* We might write to an indefinite length, to our own satisfaction at least, but space admonishes us we must stop. We must, however, notice

NYMPHÆA ODORATA. Variety obscura.

These were first noticed growing in Massachusetts, where it was much sought after by connoisseurs, but it has never been very generally collected or grown. Botanists, who have studied them, tell us they have slender, brown stems, and flowers with brownish-green calyx outside and pinkish-white within, the outer petals suffused with pink, or sometimes with bright pink-red flowers. But as this variety is so indefinitely marked, we will pass to the next variety, which is almost as indefinite as the last, but has received the name of

NYMPHÆA ODORATA. Variety Minor. SIMS.

This is also a rare variety, and may be said to be only a dwarf or stunted variety, growing in shallow water and in cold bogs or sandy soil. The flowers are white, and two or three inches in diameter, with leaves from two to five inches broad.

NYMPHÆA TUBEROSA. PAINE.

Very similar to *N. odorata* in general appearance. The leaves reniform-orbicular, about one foot broad, and very prominently ribbed; flowers from 4½ to 9 inches in diameter; petals broad and blunt, pure white, never pinkish; scentless, or with a faint odor of apples; rootstock bearing tubers often compound, which spontaneously detach themselves.

The foreign species are not in cultivation in the United States to our knowledge, but by reference to botanies we find

NYMPHÆA CÆRULEA,

The Blue Lotus of the Nile, has large fragrant, sky-blue flowers; leaves floating, crenate; lobes partly united and becoming peltate.

NYMPHÆA LOTUS,

Has large white flowers, tinted with pink: sepals red at the margins; leaves strongly toothed, and on the under-side prominently veined; grow in the slow-running streams and rice fields of Egypt.

NYMPHÆA EDULIS,

Has white flowers, and contains an abundance of starch in its roots, and is a valuable article of diet in India. But some of the best authorities think *N. edulis*, *dentata*, *rubra*, and many others, are only modified forms of *Nymphœa Lotus*.

All the *Nymphœas* are peculiar in their mode of ripening their seed under water; also, in their power of folding their petals at night and sinking below the surface of the water during night, emerging and expanding again with the sunlight. Several varieties also produce small bulbs that detach themselves and form new plants. Some varieties bloom only at night, and close at the approach of sunlight. The leaf-stock, flower-stock and rootstocks are permeated their entire length with air canals; however, some varieties are less distinct than others. They are all of easy culture, and the hardy varieties can be grown in tubs and tanks very successfully. The stove species should be grown in a warm place, in rich loamy soil. They all increase either by seed or dividing the roots or tubers.

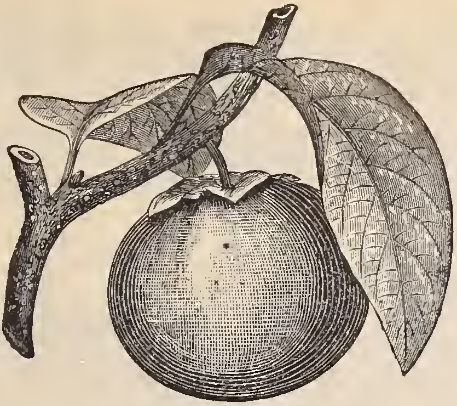


Fig. 63.

DIOSPYROS KAKI.

BY REV. HENRY LOOMIS, SAN FRANCISCO, CAL.

DID it ever occur to our readers how little attention is paid to the culture of fruit by a large portion of our people, and especially by the laboring people who pride themselves on their nice little homes. Good, ripe fruit should not be a luxury to be enjoyed by the few, but one of the necessary articles of every-day life; and one of the greatest mistakes of our people in preparing their homes, is the neglect to start fruit among their first improvements. It requires only a small outlay in money, and the time required to plant would never be missed. The same may be said of the care and attention requisite to successfully cultivate fruit trees; but small fruit, such as blackberries, raspberries, strawberries, etc., require the weeds to be kept down and the ground kept light and mellow, to produce large, choice berries.

At the head of this article we give a picture of one of the most delicious fruits of Japan, the *Diospyros Kaki*, or Japanese Persimmon—"the fruit of the gods," from *Dios*, Jove, and *pyros*, fruit or grain, (Greek). Like many of our botanical names, this one has a strange and harsh sound to our ear, and when we attempt to associate it with our American ideas, we invariably associate it with something unpalatable, at least until frost has eradicated the astringent and bitter taste of our native persimmon, *Diospyros Virginiana*. But this Japanese fruit is really the most important fruit in Japan, and is to the Japanese what the apple is to us. Like our varieties of apples, and, in fact, nearly all our cultivated fruits, they have succeeded in changing the character of the persimmon by hybridizing, until now their cultivated varieties number a hundred, some of which produce fruit each one weighing a pound. Some of the varieties are seedless and quite valuable for drying, resembling dried figs or dates, but are far superior in flavor to either. Like all other fruit, climate, soil, and especially culture, to a large extent govern the size and flavor; but unlike many of our choice fruits, they appear to be more constant in their fruiting,—at least, foreigners who have resided several years in Japan say they never knew a year when the fruit was scarce; and they also tell us the important fact that neither the curculio nor any other insect stings or effects the fruit.

The fruit commences to ripen in September, but some of the varieties last until March. These last varieties must be picked and kept cool and dry to ripen. Again, some of the varieties are soft, with a custard-like flesh, and may be served with sugar and cream and eaten with a spoon; while others have a firm, solid flesh, and correspond to our apples. To say the fruit is delicious, only feebly conveys an idea of its richness. Prof. Hilyard says: "The flesh resembles in texture that of a heath cling peach just ready for preserving, while the flavor seems to resemble both the persimmon and mango." The Pacific Rural Press says: "When cut, it resembles a mass of rich jelly-like sweets, and with a flavor reminding one of both the apricot and plum."

As before stated, some of the varieties would not be worth importing and growing, but we will add here a description of the best and that are really valuable varieties. They are—

Imperial, or *Yamato*—Color vermillion, often with dark stripes on the surface; oblong, or acorn shaped; large; flesh soft, and very sweet when ripe. When peeled and dried, it is covered with sugar that exudes from the fruit, and resembles figs. Will ripen on the trees, but is usually picked and ripened in casks. Season from October to January.

Mikado—Bright yellow or orange; flat, or tomato shaped; flesh solid; usually picked and packed in casks to ripen; young trees are said to produce seedless fruit.

Daimio—Yellowish red, with black or dark stripes about the eye; oblong, with rounded apex; flesh soft, fine flavor; medium size. "Yeddo's best persimmon." Ripens in October.

Royal—Light yellow, but darker than the last; round, large; fine for drying.

Gosho, or "Emperor's Palace"—Red, tinged with orange; round; medium size; claimed to be superior to all others in richness of flavor. Ripens readily on the tree.

Nihon—Yellowish red, with black spots on the surface, often reaching down into the flesh; round, or slightly oblong; flesh solid, very sweet; rather small; very prolific; keeps well. Ripens on the tree in September.

Taikoon—Greenish, or pale yellow; round; large. Ripens on the tree in October. A great favorite in Western Japan.

Kanosan—Yellowish red; oblong; apex bent to one side; medium size. Must be picked and packed to ripen.

Mame Gaki—Not edible, but the juice is used for paint. The only one producing a valuable wood for cabinet ware, etc., being of fine grain, mottled and black, like ebony.

The *Diospyros Kaki* is also cultivated in China, where the fruit, after pressing and drying, forms a very important article of exportation under the name of "Chinese Fig." In China, as well as Japan, there are several distinct varieties produced by hybridizing and cultivation, that are very fine, particularly the *Ox Heart*, which is deep red and very sweet.

The trees grow quite large and attain great age, some being known to be 100 years old. They are very ornamental and graceful, when planted singly on the lawn; but the seedling trees would not be likely to prove true to the desired variety, any more than our natural fruit of apples, and seedling trees do not fruit until about ten years old. The choicest cultivated (grafted) varieties are the only ones worth growing here. They will commence bearing in four years from grafting, but the fruit for the first year or two is often astringent. The older the trees the better they will fruit, and the finer the flavor and size of the fruit. Like our apples and pears, they prefer a light or gravelly soil to come to perfection, and will probably prove hardy from about 42° north latitude to the Gulf of Mexico, which is about the range of the American species. In Nipon, Japan, latitude 40°, where the snow falls to the depth of 4 or 5 feet every winter, and remains on the ground from about the middle of December to the middle of April, the fruit grows 10 inches in circumference. The tree has proved a great success in California, where large numbers are being planted. It is pronounced hardy at Flushing, N. Y., and some have also stood the past winter in central New York, or about latitude 43°. There is probably a difference in the hardiness of varieties, as some are reported as injured by the cold in the same or even warmer localities. It seems established, however, that it can be grown successfully in a large portion of this country.

Price List.—Trees, 1 year old, $ .50
" 2 " " 1.00
Seed, per dozen, 50

Trees sent by mail, 10 cents postage.

GEOGRAPHICAL BOTANY.

EASTON, PA., FERNS.

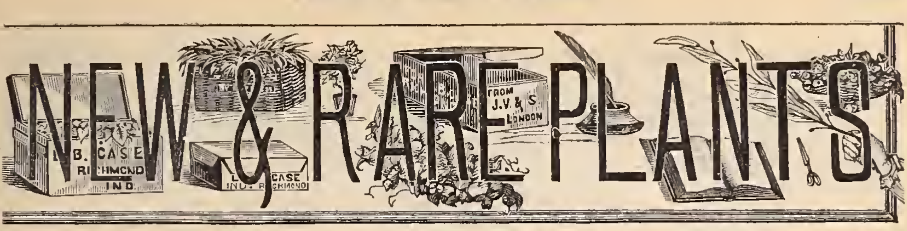
BY MISS IDA HAY.

Adiantum pedatum, L.
Asplenium trichomanes, L.
" *ebeneum*, Ait.
Aspidium marginale, Swartz.
" *acrostichoides*, Swartz.

Botrychium Virginicum, Swartz.
Lygodium palmatum, Swartz.
Osmunda cinnamomea, L.
Polypodium vulgare, L.

Pteris aquilina, L.
Pellæa atropurpurea, Link.
Woodsia obtusa, Torr.
Camptosorus rhizophyllus, Link.

[We are pleased to have the privilege of again presenting to our readers a carefully prepared list of *Fern*, from a new locality, and hope to be furnished with a new list for each number. We find names of very rare species from this locality, which adds value to all these lists.—Ed.]



NEW & RARE PLANTS

[We would request any one having new or strange Plants, to send us a notice for publication in these columns.]

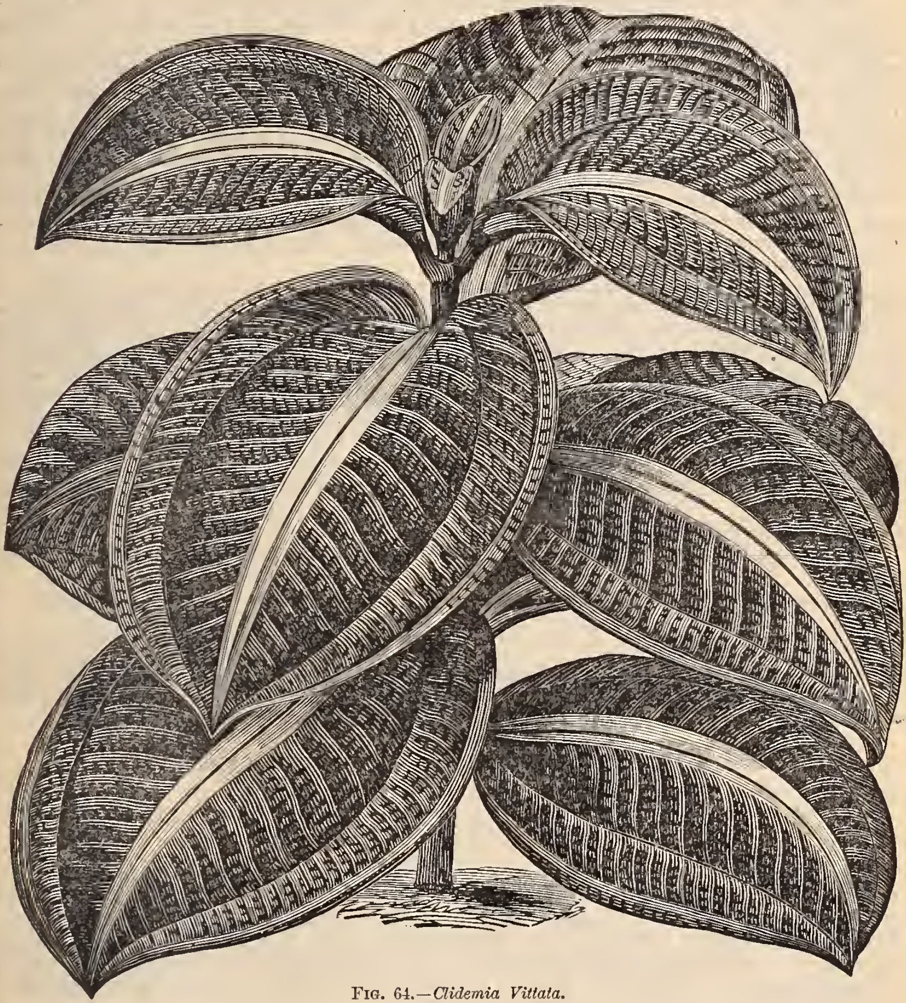


Fig. 64.—*Clidemia Vittata.*

CLIDEMIA (*CYANOPHYLLUM*) *VITTATA.* Lind. et And. (*Fig. 62.*)

In this number of the INDEX we give, through the courtesy of M. Jean Linden, the celebrated horticulturist of Ghent, Belgium, an illustration of one of his curious and beautiful plants. We give a translation from his original description, as follows:

"This superb *Melastomacee* was originally from the borders of the Huallaya, (Eastern Peru). Under the name of *Cyanophyllum vittatum* it was exhibited in our greenhouse for its blossom to develop, in order to enable us to determine its genera. In a horticultural point of view, the *Clidemia vittata* is a noble foliage plant, worthy to be exhibited in company with *Cyanophyllum magnificum*, the *Sphærogyne imperialis* and *latifolia*. It belongs to a temperate greenhouse, and its growth is rapid, its culture easy."

The plant is not yet on sale, to our knowledge, in the United States, but they could be obtained for about $2 each. We have a kindred plant in cultivation, the *Medinilla Erythrophylla*, a true *Melastomaceæ*, that is one of our choicest greenhouse winter flowering plants.

HYACINTHUS CANDICANS.

E. H. KRELAGE & SON, HAARLEM, HOLLAND.

This really excellent garden plant has been in magnificent bloom in our Nursery this summer, and was admired during a long period daily by the numerous visitors to our establishment. We had a large bed of the pure white-flowering *Hyacinth*, edged by a broad border of *Gladiolus Brenchleyensis*, which was particularly admired. A most splendid effect has been obtained by this combination. The pure white color of the *Hyacinth* makes the most striking contrast with the dark red tint of the *Gladiolus*, and this grows just the height to enable the *Hyacinth* to exceed it by nearly the whole length of the flower-spike. For this purpose it is advisable to select *Hyacinthus Candicans*, first size bulbs, and *Gladiolus Brenchleyensis*, second size bulbs. We consider *Hyacinthus Candicans*, which flowers during a period of several weeks in July and August, one of the best ornamental plants for gardens and parks, and can especially recommend the above described arrangement. The flowers of this *Hyacinth* are very suitable for bouquet making.

The *Hyacinthus Candicans* was shown by our firm at the Centennial Exhibition, Philadelphia, 1876, and the grand prize medal with diploma awarded "for very perfect display of *Gladiolus Brenchleyensis* [of which a very large bed was planted] and fine flowered plants of *Hyacinthus Candicans*, a new ornamental *Hyacinth* of stately growth, producing large white flowers," etc. This *Hyacinth* is treated in the same way as the *Gladiolus;* it is taken out of the ground in autumn, stored during winter in a dry place, safe from frost, and planted in spring. We have a very large stock of this plant, as well as of *Gladiolus Brenchleyensis.* Prices of both are such as to place them within the reach of every gardener, and we are prepared to satisfy the largest demands. A colored drawing of *Hyacinthus Candicans* is being prepared, and will be ready for distribution this autumn.

HAARLEM, Aug. 20, 1878.

[Messrs. Krelage have priced them in their wholesale Catalogue, just received, as follows:

1st size, (strong)........	8 sh. per 12.	60 sh. per 100.	500 sh. per 1000.
2d " (flowering).....	6 " "	40 " "	350 " "
3d " (medium size) ..	4 " "	30 " "	250 " "

To this must be added cost of transportation, custom dues, commissions, etc., which will double the price before they can be offered for sale here. We shall have a stock before time for planting, (Spring), and will then give retail price.—ED.]

LILIUM THUNBERGIANUM BATEMANAI.

A. G. PERRY,
Manager Herb and Bulb Dep't, Hale Farm Nurseries.

The above new Lily is in flower at the Hale Farm Nurseries, and is one of the most distinct and beautiful now in bloom. I believe it will prove to be an extraordinary fine form of *Lilium elegans var. Armeniacum* (*Venustum*), similar color, viz: rich orange apricot; later in flower, and growing 4 feet high, bearing from 6 to 10 flowers on a stem. It is without doubt a first-class Lily for autumn decoration, a charming companion for the numerous varieties of *speciosum* and *tigrinum*, none of which possess the peculiar color of this charming novelty.

TOTTENHAM, LONDON, ENG., July 17, 1878.

RICHARDIA ALBA MACULATA.

[Fig. 41, p. 61, April No. of INDEX.]

During the past season a plant of *Richardia alba maculata*, in the establishment of N. W. Mattoon, Oswego, N. Y., produced a double spathe, (flower), after the manner of the *Richardia Africana* (*Calla*), figured in the April number of the INDEX. For all we know, this is the first time a plant of this species has produced a double flower, and thinking it might be well to make a record of such things, we are glad to publish a notice of it here.

CORRESPONDENCE

[We solicit the privilege of publishing extracts from correspondence, of interest to the general reader. Correspondence upon Botanical subjects respectfully solicited.]

Haarlem, Holland, June 24, 1878.

Mr. L. B. Case, Richmond, Ind.: Your letter just at hand. Would say that *Hyacinths* are not well grown; just as they were last year—the pure white ones are generally bad. The reason therefor is that they have been injured by a bad honey dew, and storms have broken their leaves while they were growing. *Tulips* and *Crocus* as good as usual. *Narcissus* very good. *Anemones* and *Ranunculus* promise well, but are not yet taken out of the ground. Hoping these few lines may be of some use to you, I remain, dear sir, Yours, truly, C. E. VAN GOOR.

Haarlem, Holland, July 12, 1878.

Mr. L. B. Case, Richmond, Ind.: Yours of the 11th ult. came duly to hand. As to the crop of bulbs for fall planting, before the crop is in magazine, [store-house], nothing positive can be said about the matter. As we are now bringing in *Hyacinths*, we can say that in general the crop may be better than last year, but it is far below the splendid crops we used to have in former years. *Hyacinths* suffered so much in 1877, that only a very favorable season can bring them to their old strength—at least those sorts which have most suffered. This season the weather was again very unfavorable, so that the weakened varieties of last year have again suffered, and are not so good as they ought to be. Also, in some instances many bulbs have been lost by disease, so that the quantity of good quality for sale is far below the average. It is expected bulbs will flower much better than last year.

Yours, very truly, E. H. KRELAGE & SON.

Hopkinsville, Ky., July 26, 1878.

L. B. Case—Dear Sir: I have just been reading, in the Index, your article on the *Nelumbium*, (*Lotus*). We have the same growing in a small lake near here, but they were planted there. The seed came from Texas. * * * * * *

Very respectfully, T. C. J.

Gallion, Ohio, August 7, 1878.

L. B. Case: We have growing near here, in a marsh, the *Yellow Pond Lily* and the *Lotus*. There are no white ones growing anywhere near here, that I know of.

Yours, truly, G. B.

Cambridge, Mass., July 17, 1878.

L. B. Case—Dear Sir: * * * Ask in the Index if anybody has *Limnocharis Humboldti?* It is an excellent aquarium and aquatic plant, from South America, that used to be common. We have lost it. * * * * Should like a quantity of roots of *Mertensia Virginica*, taken up late in summer. * * * Would be thankful for seed of *Phacelia bipinnatifida*, Michx., if it grows near you. A. GRAY.

[Should be pleased to know that some of our friends can and have supplied Prof. Gray with the above named plants and seed, as desired. Don't fear sending too much.—Ed.]

Last Spring we received quite a quantity of *Amaryllis Treatii* from the discoverer, Mrs. Treat, and have bloomed some in the house and some in the open ground, all of which produced pure white flowers. Do other cultivators meet with the same success with this plant under cultivation? The flowers should be red, (quite dark).

L. B. CASE'S

PRICE LIST OF PLANTS.

Winter Flowering and Ornamental Leaved Plants.

	Each.	Doz.
Abelia rupestris	$0 25	$....
Abutilon Boule de Neige	25	2 00
“ Santana	20	1 50
“ Thompsoui, (foliage var.)	25	2 00
“ Vexillarium pictum	20	1 50
Achænia malvaviscus	25	2 00
Achyrauthus, 7 varieties	20	1 00
Anthurium Magnifica	2 00	......
“ Glaucescens	50	8 00
Aloes, in variety	25	2 00
Aspidistra laurida variegata	25	2 00
Astilbe Japonica	20	1 50
Bambosa Fortuneii	50	......
“ simonsii variegata	50	......
Basella rubra variegata	20	1 50
Begonia Aug. Sunderbruch	25	2 00
“ Argentea	25	2 00
“ “ punctata	25	2 00
“ “ hybrida	25	2 00
“ Carolinæfolia	25	2 00
“ Capensis	25	2 00
“ Dædalea	50	4 00
“ Elegans	35	2 00
“ Eldorado	35	2 00
“ Emma	25	2 00
“ Emerald	35	2 00
“ Eximia	35	2 00
“ Feastii	25	......
“ Frederick Seigmeyer	25	2 00
“ Grandis	35	2 00
“ Grace Fahnestock	35	2 00
“ Griffithii	25	2 00
“ Glaucophylla scandens	25	2 00
“ Humboldtii	25	2 00
“ Hydrocotylifolia	25	2 00
“ Heraclifolia nigricans	35	2 00
“ Imperialis	50c. to 1 00	......
“ Imperiator	25	2 00
“ Inimitable	35	2 00
“ Inspector Otto	25	......
“ Knerkii	75	4 00
“ La Favorite	25	2 00
“ Leopold 1st	25	......
“ Lord Palmerston	25	2 00
“ Longifolia	25	......
“ Lucy Heaver	25	......
“ Madame Alwardt	35	......
“ Madame Revere	25	......
“ Madame Wagner	25	......
“ Manicata	25	......
“ Marshallii	35	......
“ Marmorata	35	......
“ Marginata	35	2 00
“ Matilda	25	......
“ Miranda	25	......
“ Miss Helen Buist	25	2 00
“ Mrs. Stewart Lowe	25	......
“ Nebulosa	35	......
“ Philadelphia	25	......
“ President Vanderheit	25	......
“ Prince Albert	25	......
“ Pruenosa	35	......
Begonia Queen Victoria	$0 25	$......
“ Queen of Hanover	35	......
“ Quadricolor	25	......
“ Rex	35	......
“ “ magnifica	25	......
“ Ricinifolia	20	......
“ “ maculata	25	......
“ Roi Leopold	50	......
“ Rollinsonii	25	......
“ Rosedale	25	......
“ Reichenheimii	50	......
“ Smaragdina	25	......
“ Silver Queen	25	......
“ Silver Chain	40	......
“ Schœne Von Oberyenne	35	......
“ Subpeltata nigricans	30	......
“ Splendens	25	......
“ Tryphilla	25	......
“ The O'Donohue	35	......
SHRUBBY VARIETIES.		
Begonia Alida	25	......
“ Argyrostigma	25	......
“ Carminata	25	2 00
“ Diversifolia	25	......
“ Dreggii	20	......
“ Digswelliana	25	......
“ Fuchsioides	25	......
“ “ alba	25	......
“ Foliosa	25	......
“ Hybrida multiflora	15	......
“ Incarnata	15	......
“ “ variegata	35	......
“ Incana	30	......
“ Nitida	25	......
“ Odorata	25	......
“ Oilifolia	15	......
“ Parvifolia	20	......
“ Parnelli	25	......
“ Richardsonii	25	......
“ Sanguinea	25	......
“ Saundersii	25	......
“ Semperflorens	25	2 00
“ Verschafeltii	25	......
“ Washingtonii	25	......
“ Weltonensis	25	......
“ Zebrina	20	......
Bohemeria argentea	35	2 00
Bouvardia Davidsoni & Jasminoides mixed	25	2 00
“ Elegans	25	2 00
“ Hogarth	25	2 00
“ Leantha	25	2 00
“ Vreelandii	40	3 00
Brahea filamentosa, (Palm)	2 00	......
“ caryota urens, “	1 00	......
Campylobotrys Ghiesbrectum	25	2 00
“ refulgens	25	2 00
Campsidium filicifolium	50	......
Calla Æthiopica	35	2 50
“ nana	25	2 00
Canna rubra superbissima	25	2 00
Carnation La Belle	35	......
“ La Purita	25	......
“ Mineata	25	......
“ President DeGraw	25	......
“ Peter Hendersou	50	......
Centradena floribunda	25	2 00
“ grandiflora	25	2 00
“ rosea	25	2 00
Cestrum auranticum, flowers yellow	25	2 00
“ Laurifolium, “ white	25	2 00
“ parqui, “ green	25	2 00
Cissus alba-nitens	20	1 50
“ discolor	35	2 00
Clerodendron Bellfouri	35	2 00
Cobea scandens variegata	35	3 00
Coccolobia platyclade	20	1 50
Correa alba	25	2 00

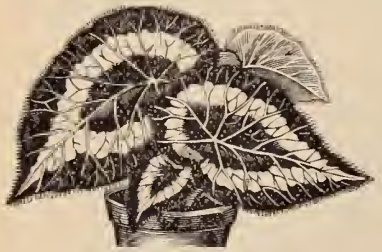


FIG. 65.—*Begonia Rex.*

	Each.	Doz.
Cuphea Danilissima	$0 15	$1 00
“ eminens	15	1 00
“ hyssopifolia	15	1 00
“ platycentra	15	1 00
Curculigo recurvata	25	2 00
“ “ variegata, small	10	1 00

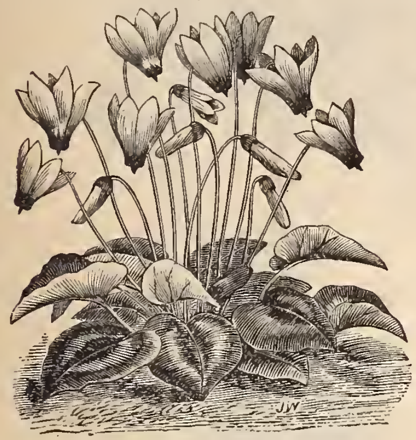


FIG. 66.—*Cyclamen Persicum.*

	Each.	Doz.
Cyclamen persicum	25	......
Cyperus alternifolius	10	1 00
“ “ variegata	30	......
Deeringia Amhersti variegata	25	2 00
Dracæna Australis	25	2 00
“ Baptisti	2 50	......
“ Braziliensis	25	2 00
“ Chelsonii	2 50	......
“ Congesta	25	2 00
“ Cooperii	50	......
“ Ferrea	1 00	......
“ Fragrans	50	......
“ Haageana	50	......
“ Indivisia	50	......
“ “ marginata	1 00	......
“ Odorata	30	......
“ Terminalis	30	......
Echeveria grandiflora	30	1 50
“ metallica	50	......
“ pulverulenta	30	3 00
“ retusa floribunda	30	1 75
“ rotundifolia	15	1 00
“ sanguinea	15	1 00
“ secunda	15	......
“ “ glauca	30	2 00
Eranthemum elegans	25	2 00
“ pulchellum	25	2 00
Eucharis Amazonica, (Amazon Wh. Lily)	75	4 00
Epiphyllum Ackermanii, flowers scarlet	25	2 00
“ phyllanthoides, flowers rose	25	2 00
“ truncatum, flowers scarlet	25	2 00
“ “ violaceum, violet	25	2 00
Euonymus Japonicus	10	......
“ “ argenteus	25	2 00
“ “ aurea variegata	50	......
“ “ “ marginata	30	......
“ “ ovata	50	......
“ “ tricolor	75	......
“ radicans variegata, hardy	25	2 00
Eupatorium arboreum	25	2 00
“ angustifolium	25	2 00
“ elegans	25	2 00
“ riparium	25	2 00
Euphorbia Brionii	25	......
“ Jacquiniflora	30	2 50
“ pendula	20	......
“ spinosa	25	2 00
“ splendens	25	2 00
Farfugium grande	35	......
“ ligatum variegatum	35	......
Feverfew, double white	15	1 50
Ficus Australis	50	3 00
“ elastica	75	......
“ Japonicus	25	2 00
“ macrophylla	1 00	......

	Each.	Doz.
Ficus nitida	$0 30	$2 50
“ Parcellii	1 50	......
“ repens	25	2 00
Fuchsia Coccinea rosea	25	2 00
“ corymbifolia	25	2 00
“ fulgens	25	2 00
“ macrophylla	25	2 00
“ Mrs. Marshall	25	2 00
“ speciosa	25	3 00
“ syringifolia	25	2 00
Goldfussia Anisophylla	25	2 00
Habrothamnus elegans	25	2 00
“ magnifica	25	2 00
Heterocentrum album	25	2 00
“ roseum	25	2 00
Imatophyllum grandiflorum	1 00	......
Hedera helix, (English Ivy)	25	2 00
“ Hibernica, (Irish Ivy)	25	2 00
“ regeneriana, (Japan Ivy)	20	2 00
“ (Russian Ivy)	20	2 00
“ helix Marmorata, variegated, golden yellow	50	......
“ Hibernica aurea maculatis, bordered golden yellow	50	......
“ marginata argentea, variegated with white	50	......
“ Japonica versicolor, variegated white and pink	35	......
Jasminum grandiflorum	25	2 00
“ odoratissimum	25	2 00
“ revolutum	35	3 00
Justicia alba	25	2 00
“ carnea	25	2 00
“ discolor	25	2 00
“ purpurea	25	2 00
Laurus Tinus	40	3 50
Ledenbergia rosea ænea	25	2 00
Libonia floribunda	25	2 00
“ penrhosiensis	30	3 00
Linum tryginum	25	2 00
Lopezia rosea	25	2 00
“ mineata	25	2 00
Lycopodium cordifolium, creeping, mossy, feathery-like	50	......
“ Hugelii, erect, plume-like	25	2 00
“ involvens, dwarf, feathery-like	25	......
“ lepidophylla, Resurrection plant	50	......
“ Wildenovia, tall, erect, fern-like	50	......
Medinilla erithrophylla	40	3 50
Mikania scandens	15	1 00
“ speciosa	25	......
“ violacea	20	2 00
Olea fragrans—Fragrant Olive	35	......
Oxalis alba—Bowieii, Deppei, Rosea, etc.	15	1 50
Palm, Brahea filamentosa (Pritchardia filiferia)	2 00	......
“ Caryota urens	1 00	10 00
“ Chamarops excelsa or Fortuni	1 50	......
“ “ humalis	1 50	......
“ curculigo recurvata	30	2 50
“ “ “ variegata	3 00	......
“ Phœnix dactylifera, (Date Palm)	50	......
“ Sabal recurvata	50	......
Specimen plants of 15 varieties at special prices.		
Panicum plicatum vittatum	30	......
“ variegatum	20	1 50
Passiflora alba, flowers pure white	25	......
“ Colvilli, flowers light blue	25	......
“ Decaisneana, blue, red & purple	25	......
“ trifasciata, variegated leaf	25	2 00
Pedilanthus tithyroloides	30	......
Peperoma arifolia	25	......
“ marmorata	15	......
“ maculosa	15	......
“ magnoliafolia	25	......
“ procumbens	15	......
“ resedæflora, flowers white	25	2 00
“ velutina	25	......
Philodendron pinatifidum and princeps	1 00	......
Piper nigrum, (Black Pepper)	25	2 00
Pothos macrophylla	3 00	......
Poinsetta pulcherima	25	2 00
Primula, Chinese varieties, (single)	25	......
“ “ “ (double)	50	......
Pittosporum Tobira Chinensis	50	4 00
“ “ “ variegatum	50	4 00
Plumbago capensis	40	3 00
“ larpentæ	25	2 00
“ rosea	35	3 00
“ Zeylanica	25	2 00

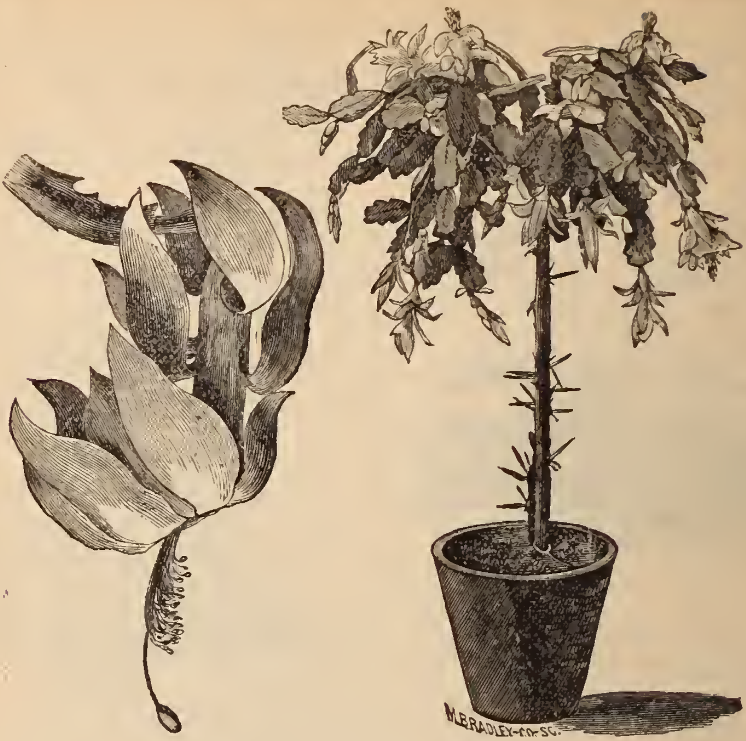

M.BRADLEY-CO-SC.

FIG. 67.—*Epiphyllum Truncatum.*

	Each.	Doz.
Rhyncospermum jasminoides	$0 30	$......
" " variegata	75	......
Rivina Braziliensis	25	2 00
Ruella Formosa	25	2 00
" maculata	20	1 50
Sanseviera Guineensis	1 00	......
" Javanica	50	......
" Zeylanica	1 00	......
Sanchezia nobilis variegata	25	2 00
" spectabilis variegata	25	2 00

	Each.	Doz.
Smilax myrsiphyllum asparagoides	25	......
Stevia compacta	25	2 00
" rosea	25	2 00
" serratifolia	25	2 00
Thunbergia fragrans	25	2 00
Torrenia Asiatica	25	2 00
" Fourneri	25	2 00
Urtica macrophylla	25	2 00
Violet, Queen Victoria	25	2 00
" Maria Louisa	25	2 00

Hardy Trees and Shrubs.

	Each.	Doz.
Acacia Rose, or Moss Locust—Robina hispida	$0 20	$1 50
Althea, Hibiscus Syriacus, single & double	25	2 00
Almond, double red flowering	15	1 50
" " white "	25	2 00
Aralia spinosa, 'Hercules' Club	25	50
Barberry Canadensis and Vulgaris	50	4 00
Benzoin odoriferum, Spice Wood—Laurus Benzoin	15	1 50
Box, Buxus sempervirens	15	1 50
Box Elder, Ash-leaved Maple—Negunda aceroides	25	2 00
Currant, Missouri yellow-flowering	15	1 50
Cydonia Japonica—Japonica	30	2 00
Deutzea Cretica plena flora—Gracilis, Fortuni	25	2 00
Euonymous Americanus & Autropurpurea	20	1 75
" radicans	25	2 00
Forsythea virdidissima—Golden Bell	20	1 50
Hydrangea paniculata grandiflora	25	2 00
" arborescens	25	2 00
" radiata	25	2 00
Kentucky Coffee Tree—Gymnocladus Canadensis	25	2 00
Lilac, common white, purple & Persian	15	1 50
" Charles X., Josekia & Floribunda	40	4 00
Lonicera Tartarica rubra—Bush Honeysuckle	25	2 00

	Each.	Doz.
Mahonia aquifolia	$0 50	$4 00
Mountain Ash, Pyrus Americana, 6 to 8 ft.	35	2 50
Mock Orange, Philadelphus Coronarius	10	1 00
" " " grandiflorus	10	1 00
Plumbago larpenta, 6 to 12 inch., hardy	25	2 00
Privet, Ligustrum vulgaris	10	1 00
" Golden variety	20	2 00
Red Bud, Cercis Canadensis	15	1 50
Service Berry, Amelancher Canadensis	15	1 50
Silver Maple, Acer dasycarpum	25	2 00
Smoke or Mist Tree. Rhus Cotinus, purple	25	2 00
" " " Chionanthus Virginica, white	50	......
Snow Ball, Viberum sterillis	20	1 50
Snow Berry, Symphoricarpus vulgaris—purple fruit	20	1 50
Snowberry, Symphoricarpus occidentallis—white fruit	20	1 50
Spiræa Billardi, Callosa (Fortuni), Hypericifolia, Prunifolia, Reevesiana, (lanceolata), Salicifolia, Sorbifolia, Thunbergii, and Tomentosa	25	2 00
St. John's Wort, Hypericum prolificum	10	1 00
Tree Cranberry, Viburnum opulus	25	2 00
Weeping Willow, Salix Babylonica	15	1 00
Wigelia Rosea	25	2 00
Wigelia nana variegata	50	......

Hardy Vines, Climbers, and Creepers.

	Each.	Doz.
Adlumia cirrhosa, Allegheny Vine	$0 15	$1 00
Ampelopsis quinquefolia, American Ivy	15	1 00
" Veitchi, Japan Ivy	15	1 00
Akebia quinata	25	2 00
Aristolochia tomentosa	25	2 00
Bignonia radicans	20	1 50
Celastrus scandens, Bitter Sweet	20	1 50
Jasminum uudiflorum and officinale	15	1 00

	Each.	Doz.
Lonicera aurea reticulata, yellow veined	25	2 00
" Halliana, flowers white	15	1 00
" sempervirens, red & yellow var.	15	1 00
Lycium barbarum, Matrimony Vine	15	1 00
Periploca græca, Silk Vine	25	1 00
Vinca, in variety	25	2 00
Wisteria frutiecns, 2 to 4 feet	15	1 00

Hardy Herbaceous Plants.

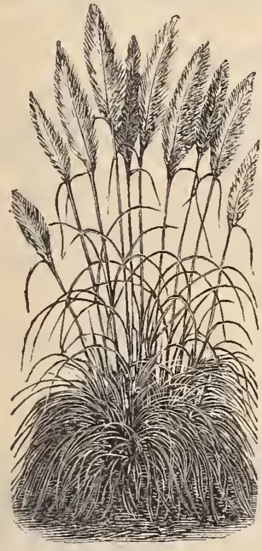


FIG. 68.—*Pampas Grass.*

	Each.	Doz.
Achilea rubra and tomentosa	15	1 50
Aquilegia vulgaris, double and single, white varies to purple	10	1 00
Asclepias tuberosa	10	1 00
Astilbe Japonica	20	2 00
" variegata	20	2 00

	Each.	Doz.
Balm, gold and silver variegated	15	1 00
Bocconia Japonica	15	1 00
Dielytra (Dicentra) spectabilis, Bleeding Heart	20	1 50
Eryngium Yuccafolium	20	1 50
Erianthus Ravenna, Pampas Grass	30	3 00
Gynerium argenteum, Pampas Grass	40	3 00
Iris, in variety	20	1 30
Lamium maculatum album	15	1 50
" " rubrum	15	1 00
Lychnis chalcedonica. scarlet	25	......
Orchids, Calopogon pulchellus	25	2 00
" Habenaria ciliaris	25	2 00
Pæonia fragrans, rose color	25	2 00
" humilis, Spanish Dwarf, bright rose	35	3 50
" Whiteleji, white, fragrant	25	2 00
Pardanthus Chinensis, Blackberry Lily	10	1 00
Phalaris arundinacea picta, Ribbon Grass	15	1 00
Phlox decussata	25	2 00
" procumbens	15	1 00
" subulata, Moss Pink	15	1 00
" perennial, old varieties	25	2 00
" " new hybrids	50	......
Polygonum Sieboldi, (see cut Fig. 54)	25	2 00
Saccharum Maddeni, a new Pampas Grass	40	3 00
Sedum carnea variegatum	25	2 00
" glaucum	25	2 00
" hypnoides	15	1 50
" Japonicum	25	2 00
" Sieboldi	25	2 00
" " variegatum	25	2 00
" Japonicum folias aurea variegata	25	2 00
" monstrosum	15	1 50
" telephium, Live-forever	15	1 50
" ternatum	15	1 50
" acra	15	1 50
Silphium laciniatum, Compass Plant	15	1 50
Staticea lanata	15	1 50
Yucca filamentosa	25	2 00

Japan Lilies.

	Each.	Doz.
Lilium auratum, Golden-banded Lily	50	6 00
" Fortunei, scarlet, spotted black	50	......
" lancifolium album, pure white	50	6 00
" " roseum, rose spotted	30	2 50
" " rubrum, crims. spots	30	2 50
" " punctatum, white, spotted with delicate salmon	60	......
Lilium longiflorum, large and beautiful, snow-white, trumpet-shaped flowers, fragrant, hardy species, from 12 to 18 inches in height	25	2 00

	Each.	Doz.
Lilium Takesima, a new Japanese variety, introduced by Von Siebold, grows about two feet high, fine foliage, large white flowers, similar in form to Lilium longiflorum, but larger; a splendid acquisition	75	8 00

American Lilies.

	Each.	Doz.
Lilium Philadelphicum, a very beautiful plant, producing from one to four bright red flowers, spotted with black; very desirable	35	3 00
Lilium superbum, one of our own native species, rarely met with in our gardens but very popular in Europe. Beautiful and rich as many of our native Lilies are, this far excels them all; bearing, as it does, a pyramid of yellowish-red flowers, from twenty to fifty in number, in full bloom in the early part of July. In good soil, it will frequently reach the height of eight feet	20	1 50

Other Lilies.

	Each.	Doz.
Lilium candidum, flower white, frag'nt	$0 25	$2 00
Lilium chalcedonicum, brilliant scarlet, elegant, fine	75	7 00
Lilium excelsum, creamy, very beautiful	50	......
Lilium fulgens aurantiacum, orange	25	2 00
Lilium fulgens atrosanguineum, blood red, shaded with orange, fine	35	3 50
Lilium fulgens umbellatum erectum—orange red, large flowers, fine upright growth	35	3 50
Lilium fulgens umbellatum grandiflorum, deep orange red, with large heads of flowers	35	3 50
Lilium fulgens incomparable, dark blood red orange, blooms freely in very large showy heads of flowers, extra fine	35	3 50
Lilium giganteum, tallest of the Lilies, growing 6 to 8 feet high, with white, trumpet-shaped flowers, streaked with carmine; not hardy here, but suited to greenhouse culture	5 00	......
Lilium, Grooms' Hybrid, blood red, spotted black	50	5 00
Lilium Humboldti, yellow, with dark spots	75	7 00
Lilium Kamtschatkensis, orange, 18 inch.	50	4 50
Lilium martagon, Turk's Cap, various colors, 3 feet	35	3 50
Lilium tigrinum, old Tiger Lily, orange-salmon, spotted black	25	2 00
Lilium tenufolium, scarlet	1 00	......

Double Flowering Lilies.

	Each.	Doz.
Lilium tigrinum flore pleno, Double Flowering Tiger Lily. This extraordinary variety was first introduced into this country a short time since by Thomas Hogg, Esq., during his late residence in Japan, and is very rare in this country, and has not, as far as we are aware, been introduced into European gardens. It is very double, frequently having thirty petals to each flower, of the same color and spotting of the single species, and is most beautiful and remarkable	75	......
Lilium candidum flore pleno, a double flowering variety of the grand old L. candidum	35	3 50
Hemerocallis Germanica flore pleno, a double flowering variety of the common old garden Day Lily	25	2 00

Lily of the Valley.

	Each.	Doz.
Convallaria majalis, white, fine large clumps	50	5 00
Convallaria majallis, strong pips for forcing......$5 per 100	...	75

SO-CALLED DAY LILIES.

Funkia.

The pretty Funkia, commonly called "Day Lily," is truly a desirable autumn flower. The plant has light, broad foliage, pretty veined. The flowers are of the purest white imaginable, trumpet-shaped, and about five inches in length. The blue variety has smaller flowers, but larger clusters, and makes a taller growth.

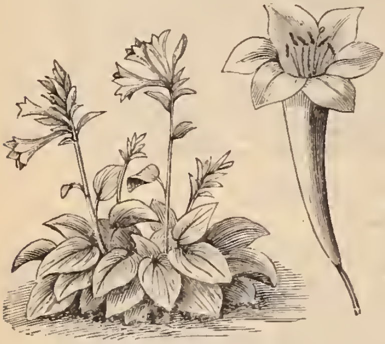


FIG. 69.—*Funkia, White.*

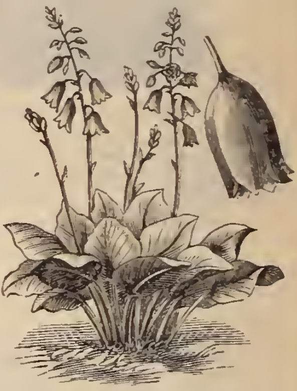


FIG. 70.—*Funkia, Blue.*

	Each.	Doz.
Funkia Japonica alba, flower white, fragrant	40	3 00
Funkia cerulia, flower blue	25	2 00
Hemeracallis flava, Lemon-scented Lily	25	1 50
" fulva, old garden variety	15	1 00
" Germanica	20	2 00

DUTCH FLOWERING BULBS.

Hyacinths.

Of all the choice house plants, none are more valuable and servicable for Winter use than the varieties of *Hyacinthus Orientalis*, Linn., (garden Hyacinth); and nothing is more admired than a bed of well selected colors of Hyacinths in full bloom, in early Spring time. But we seldom see in America the choice premium varieties, with their soft and delicate tints and shades of colors, that go so far towards making the flower shows of Europe so celebrated. One of the most noted bulb growers of Europe, J. H. Krelage, of Haarlem, Holland, estimates the varieties of Hyacinths at 2,200, and each year adds new varieties to the list, most of which are quite distinct. By reference to the correspondence, (published on page 103,) it will be seen the prospect for very fine bulbs this fall is very poor; indeed, for the first time in years, Mr. Krelage, one of the most successful originators of new species, does not offer any new Hyacinth in 1878. The prices are, however, about the same each year, but the bulbs being of an inferior grade when the crop is poor, will be graded according to the crop on hand; consequently, we pay as much for inferior bulbs when the crop is poor, as we do for good ones in a year of well grown bulbs.

HYACINTHUS ORIENTALIS.

(*Named Florist Hybrids.*)

Without doubt, these are by far the finest colors—being white, yellow, orange-salmon, rose, red, violet, purple, and light and dark blue; double and single, of large growth and fine trusses of flowers. The list of names are too formidable to attempt to publish here, and we can only say that we can furnish any of the colors above named, at from 22 cents to about 50 cents each, or from $1.75 to $3.50 per dozen.

UNNAMED AND MIXED HYACINTHS.

The following Hyacinths are in separate colors, but without names. They are especially adapted for out-door culture, in beds, groups, in flower borders, etc., producing beautiful displays of flowers at small cost. They are large, sound bulbs, and bloom freely and with very fine spikes of flowers. Plant from Sept. to Dec. 1st.

	Each.	Doz.		Each.	Doz.
Double Red	$0 15	$1 50	Single Red	$0 15	$1 50
“ White	15	1 50	“ White	15	1 50
“ Blue	15	1 50	“ Blue	15	1 50
“ Yellow	25	2 00	“ Yellow	20	1 50
“ Mixed colors	15	1 50	“ Mixed colors	15	1 50

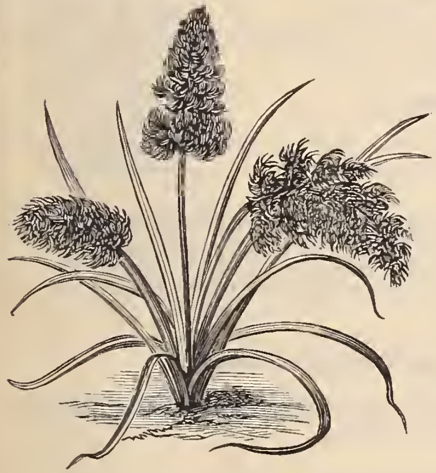


FIG. 71.—*Feathered Hyacinth.*

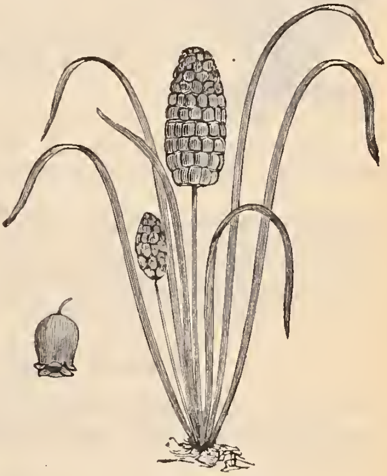


FIG. 72.—*Grape Hyacinth.*

MUSCARI. (*Hyacinthus.*)

These are very pretty Spring flowering plants, well adapted for pot or border culture, and succeed well in ordinary garden soil. Plant in Sept. or Nov.

	Each.	Doz.
Muscari Belgicus albus, white	10	1 00
“ “ cœruleus, blue	10	1 00
“ “ rubra, red	10	1 00
“ “ roseus, rose	10	1 00
“ Botryoides alba, (Grape Hyacinth, Fig. 72) white	25	2 50
“ Botryoides cœrulea, blue	10	1 00
“ Racemosa, light blue, fine	25	1 50
“ Monstrosus, blue	10	1 00
“ Muscatus major, (Musk Hyacinth, Fig. 73) blue and yellow	25	2 00
“ Muscatus minor, a smaller variety of the preceding	10	1 00
“ Plumosa, (Feathered Hyacinth, Fig. 71), purplish blue	10	1 00

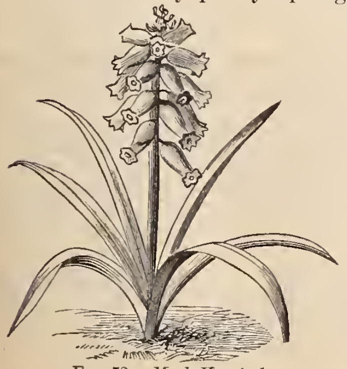


FIG. 73.—*Musk Hyacinth.*

HYACINTHUS ROMANUS.

(*Roman Hyacinths.*)

This beautiful and very valuable variety, if planted early in September, and gently forced, will bloom in November, or their flowering may be retarded till Christmas by keeping them in a cool place. By successive plantings they may be had in bloom until March, being thus very useful for florists. The flowers, which are smaller than the ordinary Hyacinth, are produced in great profusion, each bulb throwing up three or four spikes of delicately-scented, CLEAR WHITE BLOSSOMS. For a good effect, from three to five bulbs should be planted in a medium-sized pot. They are perfectly hardy, and very desirable for out-door culture, coming into bloom at the same time as the Crocus, with which they contrast very finely.

Early White Roman Hyacinth	25c. each.		$1.25 per dozen.
Single Blue Roman--two to three weeks later than the White variety	10c. each.	$1.00 per doz.	$6.00 per 100.

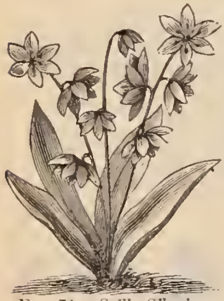


Fig. 74.--*Scilla Siberica.*

Scillas.

These are an exceedingly beautiful class of early flowering bulbs, blooming in spikes of graceful, bell-shaped flowers, of various colors. They appear most beautiful when planted in groups. All the kinds enumerated below are quite hardy, and require no particular care. They are also suitable for house culture in pots

	Each.	Doz.
Scilla praecox, dark blue	10	$1 00
" Siberica, brilliant metallic blue, dwarf, (Fig. 74)	10	1 00

	Each.	Doz.
Scilla campanulata, dark blue	10	$1 00
" amœna, fine blue	10	1 00

Tulips.

Thrive best in sandy loam. However, they produce flowers in any common garden soil. Plant from Sept. 15th to Dec. 1st.

	Each.	Doz.
Tulips, early, single white	20	2 00
" all colors, mixed	5	50
" double white	15	1 50
" " yellow	10	75
" " mixed	5	50
" Duc Van Thol	10	75

	Each.	Doz.
Tulips, Parrot or Dragon varieties mixed	10	75
Tulips, Byblœmen, mixed; white ground, flaked, and marbled rose and violet	10	75
Tulips, Bizarres, fine mixed, yellow ground, flaked and marbled crimson, black, etc.	10	75

Parrot, Monstrous or Turkish Tulips.

These are large, brilliant and very showy, and admired on account of their singular appearance. Not recommended for pot culture.

	Each.	Doz.
Admiral of Constantinople, dark red	10	1 00
Gloriosa, yellow, bright scarlet	10	1 00

	Each.	Doz.
Lutea major, large yellow	10	1 00
Perfecta, striped	10	1 00

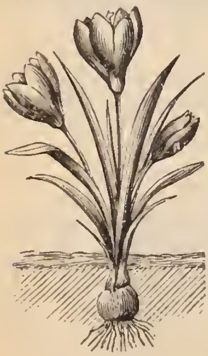


Fig. 75.—*Crocus.*

Dutch Crocus.

Plant in the open ground, in October, November and December. The Crocus will thrive in any ordinary soil or situation. In planting, the bulbs should be covered from two to three inches with fine mould, and not more than two inches apart. For edging borders and beds, the Crocus is exceedingly useful; and where planted in lines along the margin of walks, or in clumps of three, six, twelve, or more, bulbs each, and allowed to remain in the ground for several years, the effect of the immense masses of flowers which they produce is all that can be desired.

	Per Doz.	Per 100.
Blue sorts, mixed	$0 20	$1 25
White " "	20	1 25
Striped " "	20	1 25
Golden Yellow	20	1 25

	Per Doz.	Per 100.
Cloth of Gold	$0 25	$1 50
Cloth of Silver	25	1 50
Versicolor, mixed sorts	25	1 50
Mixed colors	20	1 25

Polyanthus Narcissus.

Cultivation the same as for the Hyacinth, except that the crown of the plant should be at least five inches under the surface, and for Winter protection should be covered with three or four inches of litter.

	Each.		Each.
Gloriosa, white, with orange cup	$0 20	Staten General, lemon color	$0 20
Grand Monarque, white, with pale yellow cup	20	Mixed, all colors	15

Double Narcissus.

	Each.	Doz.		Each.	Doz.
White Sweet Scented	8	75	Orange Phœnix	6	50
L'Incomparable	6	50	Silver “	6	50

Daffodil.

Von Sion, double yellow	10c. each.	$1.00 per dozen.

Jonquils.

Single, sweet scented	5c. each.	50c. per doz.	Double, sweet scented	20c. each.	$2.00 per doz.

Star of Bethlehem. (*Ornithogalum Umbellatum.*)

Flowers star-shaped, pure white, very hardy. Plant from Sept. 1st to Dec. 1st.

10c. each. $1.00 per doz.

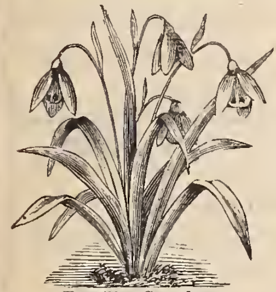


Fig. 76.—*Snowdrop.*

Snowdrop. (*Galanthus.*)

The earliest of Spring flowering bulbs. They succeed well in any soil, and should be planted where they are to remain, as they bloom best if not disturbed.

	Each.	Per doz.	Per 100.
Single—Galanthus nivalis	3c.	25c.	$1.75
Double—Galanthus nivalis flore pleno	5c.	50c.	3.50

Snowflakes. (*Leucojum.*)

The flowers of the Snowflake (*Leucojum*) have some resemblance to the Snowdrop, but are much larger, growing to the height of one foot; flowers white, and pendant from the top of the flower-stems; each petal tipped with a green spot. *L. vernum* flowers early in Spring, and is a little tender, requiring to be covered in Winter. *L. æstivum*, the Summer Snowflake, blooms later, and is perfectly hardy.

Leucojum vernum	25c. each.	Leucojum æstivum	15c. each.

Arum Dracunculus.

A curious plant, the stalks of the leaves being spotted with brown and purple, like the body of a snake. They are entirely hardy.

Arum Dracunculus	25c. each.	$2.50 per doz.

Hardy Gladiolus.

The hardy sorts bloom in the Spring, and are highly desirable and beautiful additions to the garden. They should find a place in the garden of every amateur. They require the same culture as the Hyacinth.

	Each.	Doz.		Each.	Doz.
Byzantinus, crimson purple	10	1 00	Communis flora rosea, rose	10	1 00
Communis flora alba, white	10	1 00	Colvillii, crimson and white, fine	10	1 00
“ “ rubra, red	10	1 00	Finest mixed	10	1 00

Crown Imperials.

Plant at intervals of two feet in a bed of Tulips or Hyacinths, to prevent possible monotony. Plant early, five or six inches deep, allowing them to remain for years without disturbing. They grow and bloom in common garden soil. Flower stalks two feet high.

	Each.		Each.
Aurora, single red	$0 35	Folium argenteum, silver striped foliage	$1 25
Couronne, orange	75	Maximum, bright red, single	50
Flore pleno, double yellow	1 25	“ single yellow	75
Rubra “ double red	1 00	Varieties mixed, 30c. each ; per 10, $2.50.	
Folium aureum, gold striped foliage	60		

Fritillarias.

Fritillarias, fine mixed	10c. each.	$1.25 per doz.	Fritillarias Persica	15c. each.	$1.50 per doz.

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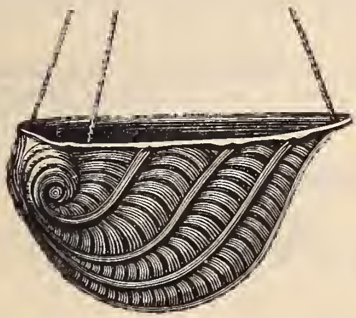

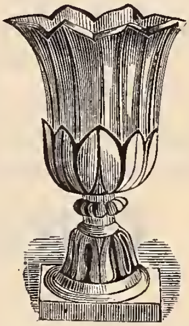

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VOLUME II.

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1879.

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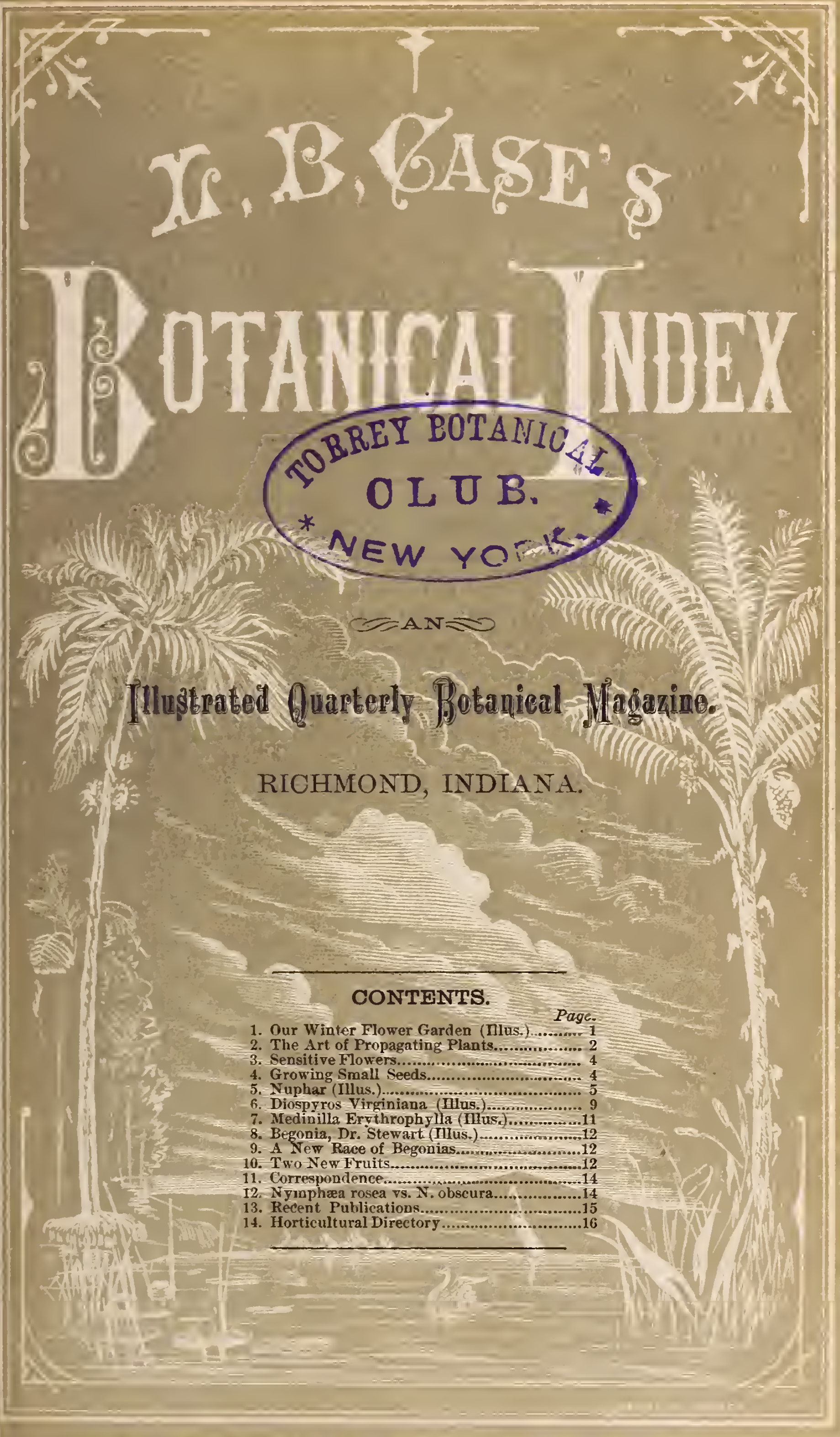

L. B. CASE'S

BOTANICAL INDEX

TORREY BOTANICAL CLUB. * NEW YORK *

AN

Illustrated Quarterly Botanical Magazine.

RICHMOND, INDIANA.

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The Botanical Index

Again we present our claim for a share of your patronage given in support of the Horticultural periodicals of the day, and hope you will look with favor upon our petition especially as it involves such a small sum of money that you will scarcely miss it, but when taken together will enable us to meet the current expense for its publication.

We have added many improvements to the BOTANICAL INDEX during the past year and propose to still further perfect its pages as opportunity may offer in the future untill we have realized our wish and can present to our subscribers at each quarter of the year, viz JAN., APRIL, JULY and OCT. a popular HORTICULTURAL MAGAZINE that will be of interest to the dealer and gardener as well as the plant-loving public in general. From the many complimentary letters received from those interested in our success, as well as from the favorable notices given us by the press we flatter ourselves that a bright and prosperous future will reward our undertakings.

We shall endeavor in the future to follow the same course adopted during the past year of treating all subjects from a strictly popular stand-point, and shall strive to merit the approval and confidence of all who may wish to assist us either by pen or purse.

We shall publish the BOTANICAL INDEX QUARTERLY as heretofore, and the subscription price will remain at 25 cents a year, which is so very cheap that it will require a long list of subscribers to pay the actual expense of publishing—to say nothing of the cost of engravings—we therefore hope to receive a liberal and hearty response to our appeal, which only will enable us to continue its publication.

The Illustrations will be made by J. MANZ & CO., which is a sufficient guarentee for their correctness as well as artistic beauty and no pains will be spared to render the future numbers as attractive as those of the past year,

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BOTANICAL INDEX

AN ILLUSTRATED QUARTERLY BOTANICAL MAGAZINE.

VOL. 2.—NO. 1. RICHMOND, IND., JAN., 1879. Published Quarterly, at 25 Cents a Year.

TORREY BOTANICAL CLUB. * NEW YORK. *

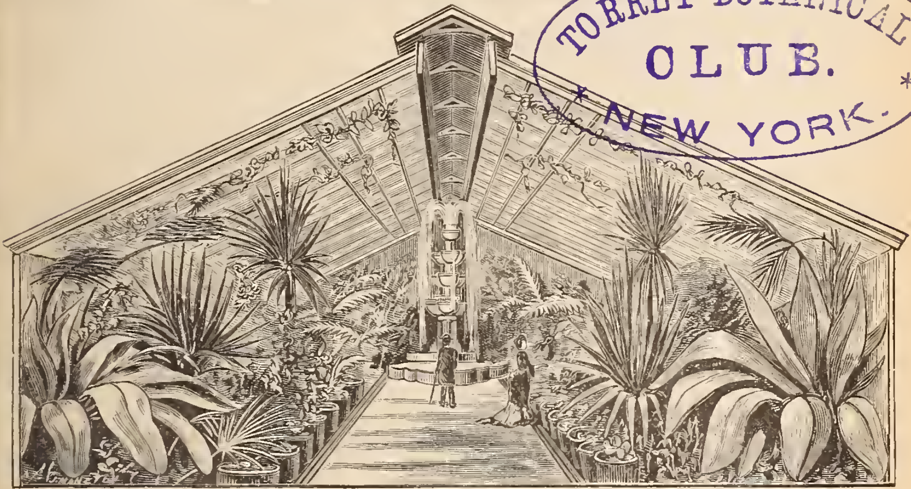


FIG. 76. *Paradise and Victoria Conservatory.*

OUR WINTER FLOWER GARDEN.

MOST of our readers are plant lovers—at least, we will assume this to be a fact,—and as such, will make another effort this winter to utilize a window for a winter flower garden; but with only a small number will the effort prove entirely successful: not, however, from any lack of space adapted to their wants, nor of longing, anxious eyes to see and realize the object of their ambition, but from a great variety of causes combined. Some will make a poor or injudicious selection of plants to start with, while others will often fail from neglect, or, what is still worse, from too much care and attention; particularly by constantly watering them, which sours the earth and rots the roots, or by keeping them too warm.

To all such, the instructive pages of the horticultural journals and magazines are ever welcome visitors, particularly as their success usually depends upon the information gained from learning of the experience of others; and it certainly is money saved to know of and avoid the failures of others, in any branch of business. For this reason we would urge all our floral friends to subscribe for at least one horticultural journal, and not only learn from its pages, but let others know of your success or failure by briefly stating them in plain language through the columns of your favorite paper. Perhaps it would not be amiss here to carry the point still further, and respectfully solicit your subscription to the BOTANICAL INDEX for 1879.

But some of our readers have one or more greenhouses or a conservatory well filled with a choice selection of rare or well grown specimens of plants, that are a feast to the plant lover; and during winter, the inhospitable weather which debars out-doors enjoyment seems to make the observatory doubly interesting. For this reason we have chosen for the first illustration in the second volume of the Index, a view of the interior of B. S. Williams' celebrated "Paradise and Victoria Conservatory," at London, England. It is here we find the choicest specimens of rare plants grown to perfection; in fact, it is the embodiment of taste, beauty, luxury and wealth combined, to which only a limited number of plant lovers can ever expect to attain. Perhaps we are safe in saying there are not half a dozen of these gems in existence, excepting those under government patronage. So we need not feel discouraged because we cannot afford the same; but let us enjoy what we have, to the fullest extent and with a thankful heart for the privilege.

THE ART OF PROPAGATING PLANTS.

PROBABLY no part of horticultural work is so imperfectly understood by the majority of gardeners and nurserymen, as the art of propagating plants; at least, we must consider it as the best reason for such poor success as often attends the efforts of many persons who are very successful in growing plants, but who never seem to understand the required treatment necessary to successfully start the young plants to growing. We often receive inquiries for a good book with full instructions for propagating plants, but must always reply that we know of no work complete on the subject. Although nearly all good horticultural books, as well as all the agricultural and horticultural journals and magazines, usually contain a little information on the subject, and nearly all the dealers' annual seed, plant and tree catalogues usually contain much more that is valuable; still, propagators must depend mainly upon personal experience for their information.

In "The Garden," London, Eng., Oct. 27, 1877, we find a paper on "Propagating Plants by Root Cuttings," read before the Scottish Horticultural Association, Oct. 2, 1877, by Robert Lindsay, so full of interest, that after reading it over several times we have concluded to republish it in the Index, because most of our readers will probably never have the privilege of reading it in its original form. It says:

"The most natural method of propagation is by means of seed; but there are many plants in cultivation which rarely produce seed, and many more which cannot be depended on to come true from seed. Moreover, we have now many hybrids, a class of plants which in all probability will be largely increased before long; as is well known true hybrids seldom seed, and those which do produce fertile seeds we often find reproducing varieties totally different from the kinds we wish to preserve. It is evident, therefore, that we must adopt other means to increase those plants, and at the same time keep their distinctive peculiarities intact. Fortunately there are many ways by which this may be done, such as by means of cuttings of the stem, grafting, budding, inarching, layering, division, and the mode which I am about to describe, by cuttings of the root. Before doing so, I may mention that it is not always easy to distinguish between stem and root; many forms of stems are often confounded with roots, such as the rhizomes of the Iris, the corms of the Crocus, the bulbs of the Lily, the tubers of the Potato, the soboles of the Couch Grass, &c., which are all forms of underground stems. The roots I mean to refer to are different from any of these, but inasmuch as they possess the power of forming leaf-buds, they are different from true roots, which, according to botanists, have no such power; one of the main distinctions between stem and root being the absence of any provision for forming leaf-buds on the latter. They appear to be intermediate, that is, can perform the functions of both root and stem if placed in favorable circumstances. The propagation of plants by means of root cuttings has been long practised, for I find that the late Mr. T. A. Knight in 1816 succeeded in growing Apples, Pears, Cherries, and Plums, by putting pieces of their roots about a foot long into the open ground. Leaf-buds are formed naturally on the roots of Pyrus japonica, Moutan Pæony, Plums, Anemone japonica, and a few others. There are many plants which possess this power of forming buds on their roots, although they remain dormant until, either by accident or design, their roots are cut and they then push buds. It is generally supposed that the number of plants capable of being propagated in this way is very limited; but, judging from my own experience, I am inclined to think that there are many more than we are at present aware of. Having got a plant which we know will increase by means of roots, the first thing necessary to be done is to shake the soil or wash it clean away from the roots; next, cut them into little pieces, generally about half inch long; but some kinds, such as the Ipecacuanha, for example, I have found to succeed when only one-sixteenth of an inch long; others require to be about one foot long. A curious fact in connection with this is, that usually no more than one bud starts, whether the pieces of root be left one-sixteenth of an inch or a foot long; all the strength goes to the bud that starts first and the others remain dormant. Having got the roots cut up, boxes or seed-pans may be prepared for them the same as for ordinary cuttings, viz., filled with light sandy soil, adding a little peat for such plants as naturally like that kind of soil. The pieces of root should then be scattered over the surface of the pans and covered about their own depth according to the thickness of the roots used; give them a slight bottom-heat, and in a fortnight or three weeks' time, the young buds will be found rising above the soil and elbowing each other for room. Spring is the best time to put them in, although they may be inserted all through the summer months. In the case of many hardy plants bottom-heat is unnecessary, unless where time is an object, which in most cases it is. Care must be taken in hardening off plants struck in heat, as they will be found to suffer more than in the case of stem cuttings unless gradually inured to the cold. This is the whole process, and it has several advantages to recommend it. 1st. A good supply of roots may be got without at all destroying the appearance of the stock plant. 2nd. The cuttings are more easily and quickly put in, and in the third place the results are more satisfactory; provided the roots are healthy, it is rare to find a piece which will not grow. The only difficulty is to learn what plants are capable of being propagated by means of roots, and this can only be discovered by experiment, as there is nothing, so far as I can see, about the appearance of the roots themselves that would lead one to be certain whether they could be propagated in that way or not. The following plants I know, however, may be increased by means of pieces of roots. My first attempt was made with Aralia papyrifera, and then with Aralia japonica; I do not, however, yet know whether the new Aralias, such as Veitchi, elegantissima, and others of that section may be increased by roots or not; but most probably they may. In that case they would require to be on their own roots, and not grafted plants. All the kinds of Dracænas may be propagated in this way; also Hellebores. particularly H. grandiflorus or maximus. Pelargoniums thus treated will also succeed, but not so well as by stem cuttings, with the exception of fancy Pelargoniums, which are often difficult to strike by means of stem cuttings. Monsonia lobata, another Geraniaceous plant, Pulsatilla bracteata, a somewhat rare Anemone which has fibrous roots (not a creeping rhizome like the Wood Anemone) may also be increased by root cuttings. Anemone japonica (which grows naturally from the roots), Clematis, and Ipecacuanha, may also be increased by means of root-cuttings. Plants of the Ipecacuanha were first sent out to India in Wardian cases, but it was afterwards found that the roots alone could be successfully sent out by post, and several small boxes of them were sent out in that way by Prof. Balfour, along with printed instructions as to their propagation drawn up by Mr. McNab. The roots arrived in good condition, and on being treated as directed, abundance of plants was the result. Drosera dichotoma, a rare Australian Sundew, strikes readily by means of pieces of root. Cuttings of all kinds of Bouvardias are now commonly raised from roots, as are likewise Rosa rugosa and other species, and many of the hybrids, together with Senecio pulcher; Scolymus grandiflorus, Viola pedata, Cephalotus follicularis (the Australian Pitcher plant), Passifloras, Melianthus, Greyia, Xanthoceras sorbifolius, and Venus's fly trap (Dionæa muscipula). With regard to this plant it is certainly not the root that is propagated, but the bulbous enlargement formed by the old leaf-stalks, the scales of which are pulled asunder in the same way as is often done in the case of Lily scales. Sarracenias and Darlingtonia californica may also be propagated in this way, but they are clearly rhizomes, not roots, that are used for the purpose."

This is a subject of so much importance to the American gardener, that we will request those who have had experience in propagating from root cuttings, to send us for publication a supplementary article.

NEW OR LITTLE KNOWN FERNS OF THE UNITED STATES.

Under the above heading, Professor D. C. Eaton announces in the October number of the "Bulletin of the Torrey Botanical Club," the discovery of four species of Ferns new to the United States. They are; *Ceratopteris thalictroides*, in Southern Florida, by Dr. A. P. Garber; *Cheilanthes microphylla*, on an island near the mouth of the St. John's River, Florida, by A. H. Curtiss; *Asplenium firmum*, at Ocala, Fla.; *Asplenium cicutarium*, and *A. myriophyllum*, near Lake Panasopkee, Fla., by W. H. Shockley. These are all tropical species, and Prof. Eaton expresses the opinion that there are still many other undiscovered species in the swamps and hummocks of Florida. Lucien M. Underwood also describes in the same number of the "Bulletin" a new form of *Aspidium marginale*, from several localities in Western New York, also from near Worcester, Massachusetts.

SENSITIVE FLOWERS.

BY C. H. BAKER, PHILADELPHIA, PA.

WHILE making a drawing from a fine plant of *Opuntia vulgaris*, July 2d. 1877, from New Jersey, I observed that its stamens were very sensitive when touched. They are, as you will remember, arranged about the pistil in several concentric whorls to the number of three hundred and more, with anthers interwove—those in the outermost whorls being the longest and maturing first. When they are touched, struck, or bent, those so treated close quickly toward the pistil, the motion is communicated to others, and in a few seconds there may be fifty assembled in a circle round the pistil, with numerous anthers either in direct contact with or close above the six-cleft stigma. If a single filament in the outermost whorl is bent backward a little, it changes its position with such force as frequently to break its way through the inner whorls in moving toward the pistil; sometimes it starts up a few others, so that in such cases only a small number close against the pistil, and a ring does not assemble, as before remarked.

This sensitive action has taken place in every flower that I have examined, and I have seen it produced, as was to have been expected, by the burrowing of an insect among the filaments close to the base of the pistil,—an indubitable illustration of the scope of insects as agents in fertilization, all the more interesting since, through the peculiar property of the plant itself, an actual transfer of pollen by the insect would seem to be unnecessary.

In alluding to this, I desire to learn if this property is exhibited by the stamens of other prickley-pears in the south and south-west, which the circulation of the INDEX will doubtless soon satisfactorily determine.

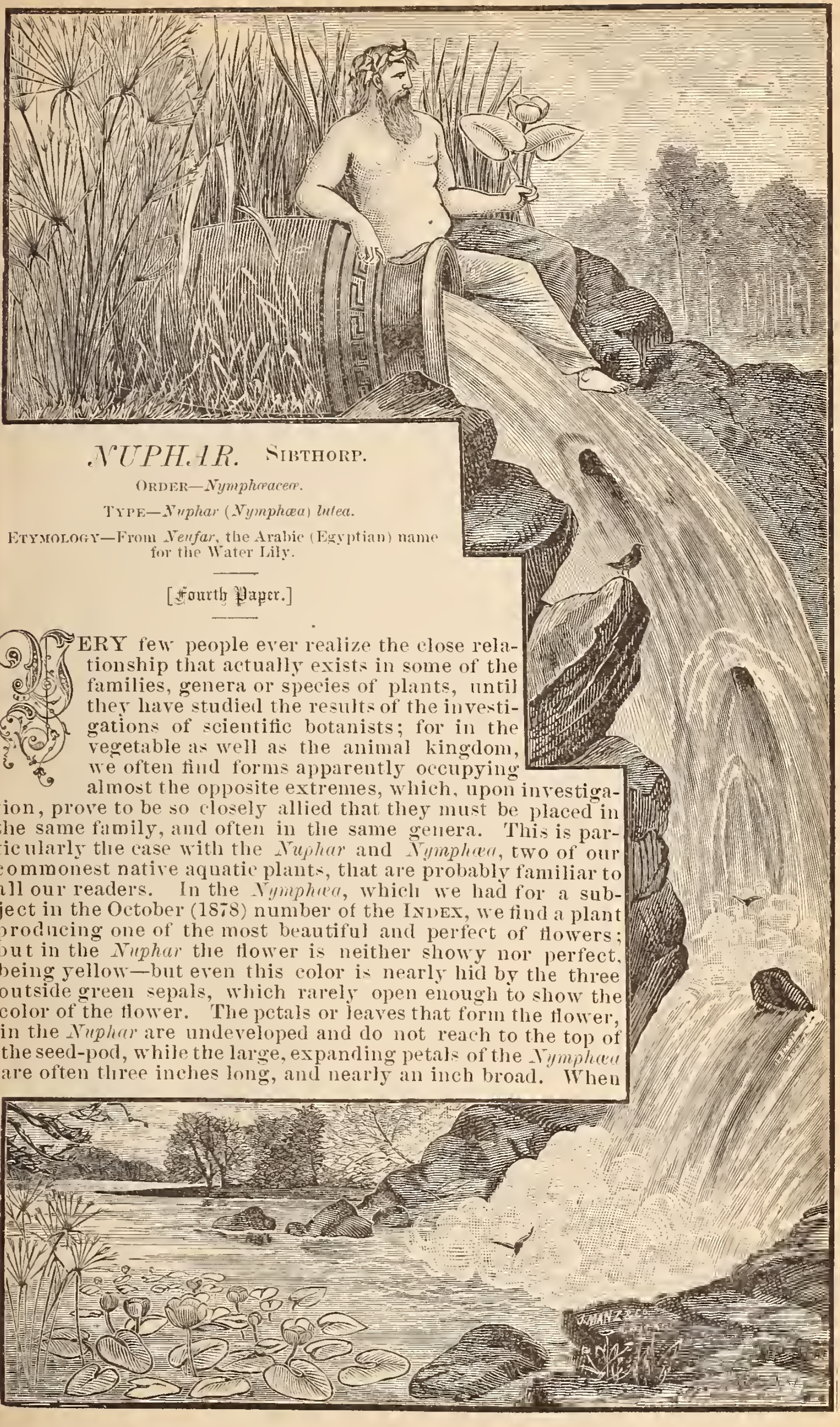
Oct. 15, 1878.

GROWING SMALL SEEDS.

G. P., in "The Garden," Oct. 27, 1877: "Small seeds, such as those of Lobelia, Begonia, &c., occasionally present, especially to the amateur, considerable difficulty in inducing them to germinate. This arises from the fact that, while it does not do to cover such seeds with soil, a very small amount of surface dryness is sufficient, when the seeds are swelling, to destroy them altogether. Covering the pots with moss or sheets of glass is occasionally recommended; but both tend to draw up the seedlings, and not unfrequently cause them to damp off. Such being the case, I submit the following plan, with which I have been very successful in raising hybrid Begonias, whose seed is very small indeed. In most plant-houses may be found pots surfaced with a delicate growth of moss, varying from the condition of a green felt to fully developed moss. On this sow the seeds. The moss maintains a general moisture, while its fibres retain among them the tiny seeds and prevent them from being washed down into the soil and lost. A piece of turf (peat) kept close and moist under a bell-glass also answers the purpose, but air must be freely and judiciously admitted as soon as the seeds are up. Altogether I am of opinion that the best *nidus* for such seeds as I have named is a moss-surfaced pot; in proof of this I may say that I have numbers of seedling Begonias amongst the various mossy pots in my little plant-stove—some showing flower, and others not ten days old."

[There is nothing in all our greenhouse experience that gives us so much anxiety and with which we are so completely discouraged, as in our efforts to grow the seed of Begonias, Calceolarias, and a few other varieties of plants that have such small seed—for the seed of the Begonia is as fine as dust. If we can utilize an unsightly pot of moss for this purpose, we shall feel as though we had learned something of great benefit, and had taken a step forward in the art of propagating.—ED. INDEX.]

THE "Gardener's Monthly," in its notice of the recent exhibition of the Pennsylvania Horticultural Society, says: "There was one exhibitor who deserves great praise for something really attractively new to an exhibiton, Mr. E. D. Sturtevant, of Bordentown, N. J., who made a display of Water Lilies, Nymphæa cœrulea, the light blue; the remarkably brilliant red N. dentata; and N. dentata Devonienses; and our own sweet white N. odorata. This pretty red, white and blue combination, floating with their glaucous green leaves in a little fountain made for them, was particularly attractive."



NUPHAR. SIBTHORP.

ORDER—*Nymphœaceæ.*

TYPE—*Nuphar (Nymphæa) lutea.*

ETYMOLOGY—From *Neufar*, the Arabic (Egyptian) name for the Water Lily.

[Fourth Paper.]

VERY few people ever realize the close relationship that actually exists in some of the families, genera or species of plants, until they have studied the results of the investigations of scientific botanists; for in the vegetable as well as the animal kingdom, we often find forms apparently occupying almost the opposite extremes, which, upon investigation, prove to be so closely allied that they must be placed in the same family, and often in the same genera. This is particularly the case with the *Nuphar* and *Nymphæa*, two of our commonest native aquatic plants, that are probably familiar to all our readers. In the *Nymphæa*, which we had for a subject in the October (1878) number of the INDEX, we find a plant producing one of the most beautiful and perfect of flowers; but in the *Nuphar* the flower is neither showy nor perfect, being yellow—but even this color is nearly hid by the three outside green sepals, which rarely open enough to show the color of the flower. The petals or leaves that form the flower, in the *Nuphar* are undeveloped and do not reach to the top of the seed-pod, while the large, expanding petals of the *Nymphæa* are often three inches long, and nearly an inch broad. When we attempt to compare the two for analysis, our first idea is, "How unlike in general appearance."

Old botanical writers placed the *Nymphæa* and the *Nuphar* in one genus—the *Nymphæa*; but as they often grouped together genera and families of plants for very indefinite reasons, we may reasonably suppose they were to a large extent uncertain of the true characters of the *Nuphar*, and placed it in the genus *Nymphæa* simply because there was no other place so appropriate for it. Be that as it may, we know they were placed there, and that an English botanist and traveler, Sibthorp, separated the *Nuphar* from the *Nymphæa*, and restored Dioscorides' old Greek name, *Neufar*, which, however, is only the adoption of the Greek word *Naufar*, or *Nyloufar*, which again is the Arabic, or, as Prof. Gray tells us, the Egyptian pronunciation of the word for Water Lily. Perhaps we should say that modern botanists do not recognize any one as the author of a name for a family, genus, or even species of plants, who lived and wrote before 1682; and usually, botanical names do not date further back than Linnæus, 1736. But the names given by Tournefort, Linnæus, Magnol, the two Jussens, Adanson, De Candolle, etc., are often those first applied by Aristotle, Mithridates, Dioscorides, Pliny, and others, some of which date back to the fourth century before the Christian era. It is a noble tribute to the memory of those old Greek and Roman naturalists for modern botanists to adopt their nomenclature; for although we now see many of their names were founded on false ideas, still there is something so grand and enchanting associated with those old heathen ideas, that all must acknowledge the aptness of the names.

Of all the objects of creation, probably none have been so universally studied as the vegetable kingdom, and certainly none of the sciences have reached a higher point of perfection; indeed, it is quite doubtful if any science is so thoroughly mastered as the science of botany. Nearly all the old Greek and Roman botanical writers made the study of plants a special business from their desire to learn more of their medical properties, while a few studied the vegetable products of a country in connection with their geographical researches. Among all primitive nations, the study of plants for food, for medicine, for dyes, and other uses of luxury, or for the deadly poisons contained in their juices, has been a never ceasing occupation of mankind as far back as history records their occupation. When we wrote of the *Nymphæas*, in the last number of the INDEX, we had for a subject one of the choicest families of plants in the vegetable kingdom to talk about, and felt as though we would never tire of extolling their beauty; but now we have reached the other point of the extreme, and for a subject we have one of the most unpretentious of plants, or at least one of the most unattractive of flowers. Still they are quite desirable, and with other plants add a charm to a large aquarium or pond, particularly as aquatic plants that thrive under cultivation are so rare.

It may seem superfluous to many to see so much time and space devoted to a genus of plants that are so common, and withal whose flowers are so devoid of beauty; but before we pronounce judgment upon them let us examine their case a little. We will first make a list of the known species, upon the most liberal basis admissible, and afterwards receive the reproval of many for our liberality; for a strong doubt exists in the minds of many as to there being more than two species, viz: one, *N. lutea*, of Europe and Asia; the other, *N. advena*, of America.

SPECIES.	SYNONYMS.	HABITAT.	COL'R OF FLOW'R.	DESC.
Nuphar advena, Aiton.	*Nymphæa*, of old authors.	North America.	Yellow.	1739
" *advena variegatum*, Engelmann.		North America.	Yel. pur.	1866
" *Kalmium*, Pursh.		North America.	Yellow.	1803
" *luteum*, Smith.	*Nymphœa*, of old authors.	Europe and Asia.	Yellow.	1542
" *polysepalum*, Engelmann.		Western U. S. A.	Yellow.	1865
" *pumilum*, Smith.		Scotland and N. Am.	Yellow.	1800
" *sagittifolium*, Pursh.		Southern U. S. A.	Yellow.	1789

We will now notice each species or variety if you please, in detail. First is

NUPHAR ADVENA. AITON.

Leaves submerged, floating and erect, thick, glossy, roundish, ovate or almost oblong in outline; from 10 to 12 inches long, and 8 or 10 inches broad; sinus broad or V-shaped; flowers globular, about 2 inches broad; sepals, 6.

NUPHAR ADVENA, VARIETY VARIEGATUM. ENGELMANN.

Very similar to last, but with the sinus in the leaf closed or narrow; flowers often partly purplish (hence the name), globular; sepals, 6.

NUPHAR KALMIUM. PURSH.

A miniature variety, with leaves submerged and floating, small, delicate, fleshy and oval; sinus narrow, so that the lobes nearly meet; leaves from 1½ to 3 inches broad; flowers globular, small, only from 1 to 1½ inches broad; sepals, 5.

NUPHAR LUTEUM. SMITH.

Leaves large, cordate, oval, pointed, submerged and floating; leaf-stock angular, especially on the upper part; flowers expanding, fully 5 inch. across; sepals, 5, obtuse.

NUPHAR POLYSEPALUM. ENGELMANN.

Flowers very large, and numerous sepals.

NUPHAR PUMILUM. SMITH.

Another dwarf or miniature species. Leaves submerged and floating, only about one inch in diameter; flowers small, only from one-half to one inch broad when open.

NUPHAR SAGITTIFOLIUM. PURSH.

Leaves submerged and floating, long, thin, cordate, obtuse, sagittate, smooth; lobes at the base expanding, from 10 to 15 inches long and 2 inches broad; earlier leaves produced under water, and quite thin; flowers globular, 2 inches broad; sepals, 6; petals none, being transformed into stamens.

This is assuming it to be a fact that all the forms heretofore described have sufficient specific characters to warrant a separation into distinct species, which, however, is quite doubtful; for many botanists consider *N. minium*, which is found in the north of Europe and Asia, only a dwarf and stunted variety of *N. luteum;* while *N. pumilum*, from Scotland and north-eastern U. S. A., (from Pennsylvania northward), and *N. Kalmium* (*N. intermedia*, Ledeb.) also from north-eastern U. S., are usually considered as only varieties of *N. luteum*, often too obscure to be recognized; and the southern form, *N. sagittifolium*, and western form, *N. polysepalum*, Prof. Gray says may run into *N. advena*. According to Prof. Gray, (Manual, edition of 1878,) the only known American specimen of *N. luteum* like the European (flowers fully two inches across) is from Manayunk, seven miles below Philadelphia, Pa. (We regret not having at hand the proper authorities to give the synonyms according to the latest revision, as was our original design; but as it is a matter of so much dispute what species are valid and which are void, perhaps it is best not to attempt it any further.) *N. advena* also differs very materially in different portions of the country, from the usual published descriptions, and it is a matter of surprise that some of the numerous species makers have not before now added a new name to our southern gigantic form. Mrs. Treat, in writing of them as she saw them growing in the St. John's River, Florida, says: "Here they assume gigantic proportions. The leaves measure from 18 to 20 inches across, and cover the water on either side of the deep channel for the distance of a mile or more. The leaves and flowers reach the surface of the water in some places from a depth of 10 feet."

Let us now examine a single flower in detail,—for all plants are classed by their flowers,—and as we have said they were inconspicuous and devoid of beauty, we will see wherein their interest lies.

The species are all so near alike that a flower from any one will answer our purpose, and as *Nuphar advena* is the easiest to procure, we will select it as our representative; and as our artist has prepared for us such a perfect picture, Fig. 78, from a number of flowers collected for his special use, we will now study his picture. We have also taken the liberty of copying the figures of enlarged stamens and petals of the *Nuphar*, from Prof. Gray's "Genera of Plants," (Plate 44, Vol. 1,) in order to more clearly elucidate the subject. In our illustration, Fig. 78, *a*, we give a profile view of an expanded flower, but with one of the sepals removed to show the position and form of the petals, stamens, and seed pod, (fruit). Here we find six very unequal sepals, or outer leaves of the flower, (some species have only five), the three outer ones rounded, green outside except a small portion of the upper border, which, together with the inner surface, is bright yellow; the three inner sepals larger, bright yellow both outside and inside. Fig. 78, *b*, represents the fruit, with the sepals, petals and stamens removed. The small diamond-shaped scars at *c*, indicate the point of attachment of the petals and stamens. Fig. 78, *d*, *e*, are from Prof. Gray's excellent plates, and represent the petals many times enlarged, showing two views of the same object. Fig. 78, *f*. *g*, *h*, are from the same work, and represent an inside view, *f*, of a stamen enlarged; *g* representing an outside view, while *h* represents a lateral view of the same. The petals, or what answer to petals, are from ten to twenty in number, small, thick, fleshy, truncate or scale-like, narrowly oblong, often transformed into

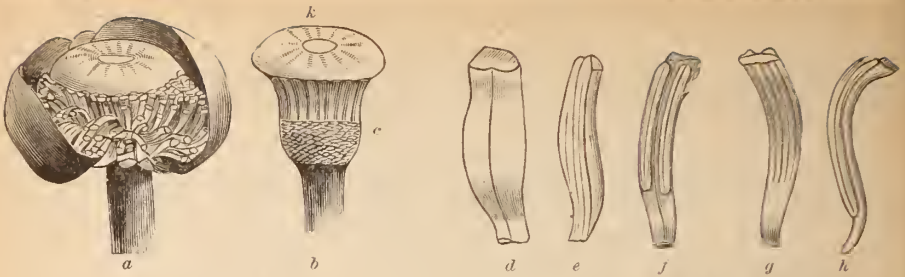


FIG. 78. *Nuphar adrena.* (From Prof. Gray's "Genera of Plants.")

stamens and strongly resembling them, but shorter, inserted with the stamens into an enlargement of the receptacle under the ovary, (Fig. 78, *c*,) shorter than the circular, and sessile many-rayed peltate stigma, (Fig. 78, *k*.) Stamens numerous and in several rows, ultimately bent backwards, (recurved), persistent; fruit ovoid naked, strongly furrowed; berry oblong, usually ripening above water, but bursting irregularly to allow the smooth seed, which are imbedded in pulp, to escape; the internal structure as in *Nymphœa*, only there is no arrillus to the seed.

The flowers appear immediately after the leaves in spring, and the plants continue to bloom all summer, even after the frost has killed the erect leaves; and perfect but dwarfed flowers may be seen floating about just beneath the surface of the water, after the weather has become so cold in the fall that ice has already formed half an inch thick upon the surface of the water. The root-stocks, or rhizoma, are long, creeping, and growing horizontally in the mud, very similar to the *Nymphœa*, but much larger, being often found 4 inches in diameter. Fig. 61, page 96, vol. 1, BOTANICAL INDEX, will convey a very good idea of the rhizoma, which are easily distinguished from those of the *Nymphœa* by their larger and more robust growth, as well as by their being more thickly covered by a large, prominent, almost circular scar, left after the decay of the leaves. The leaves and flowers grow only from the end of the rhizoma, as in the *Nymphœa*, and are borne singly on long, smooth, cylindrical or indefinitely triangular stems, that, like all other Water Lilies, are traversed their entire length by air canals. The first leaves to start in the spring never reach the surface of the water, but are what botanists term "submerged leaves," that is, grow up a few inches, unroll or spread out, and remain stationary. They are usually of a bright, glossy, purple color, thin, of soft and flexible texture. The floating leaves are large, thick, glossy green upon the upper surface and usually violet or purple upon the under surface. The erect leaves are bright, shining, glossy green upon both the upper and under surfaces, but do not appear to differ materially from the floating leaves; probably their difference consists in a more robust leaf-stem holding the leaf erect.

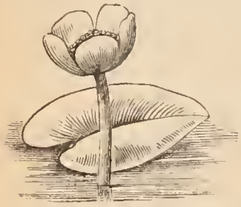


FIG. 79.

In the great economy of nature there are many uses to which the *Nuphar* are adapted. The roots are known to have been used by many uncivilized people for food. "The flowers of *N. luteum*, (Fig. 79,) have the perfume of brandy, and in England have received the name of 'Brandy Bottles.' The flowers are used by the Turks in the preparation of cooling drinks, like sherbet. At the base of the petal is secreted on the receptacle a honey-like fluid. The root-stocks, bruised and infused in milk, are stated to be destructive to cockroaches, and when burnt to be particularly obnoxious to crickets."—(*Treas. of Botany.*) The seed contain a large quantity of farinaceous matter, and are used in some countries for food. When planted in a large aquarium or pond, they make a rank or more vigorous growth than any other variety of aquatic plant; consequently, it contributes more towards purifying the water, by the large amount of oxygen supplied it and carbon absorbed from it, which is of the utmost importance to pure water and healthy animal life in confinement. For this reason we consider them the most valuable of all our hardy aquatic plants for cultivation.

But we cannot dismiss this article without a word in reference to our illustration, on page 5. In the October (1878) number of the INDEX, we referred to ancient mythology, and its close relationship to botanical nomenclature, and for a title page to the article on Water Lilies in this number, our artist has prepared a happy delineation of the ideas there expressed. In addition to the *Nuphar* represented as growing in the water, we have in both the upper and lower left hand corners of the same illustration a good picture of the growing plants of *Papyrus antiquorum*. We are proud of the artistic design and workmanship of all our illustrations, but this one especially we consider faultless, and for a wood-engraving we must say that we seldom see its equal.

NATIVE FRUITS.

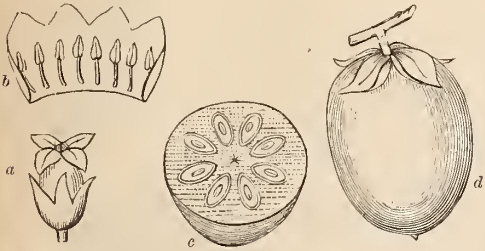


FIG. 80.
[From Prof. Gray's Botanies.]

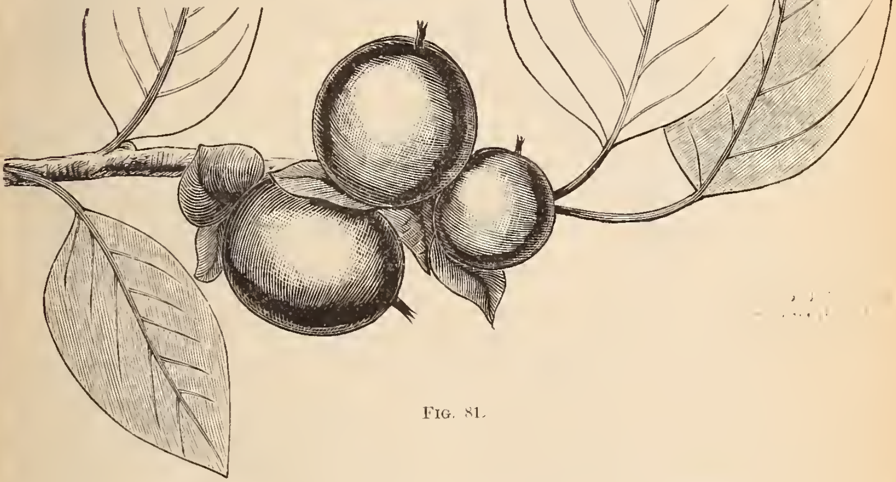


FIG. 81.

DIOSPYROS VIRGINIANA. LINNÆUS.

[*American Persimmon.*]

OF all our native fruits, perhaps none are so little known, and at the same time so familiarly spoken of by the mass of people, as the common American Persimmon—the *Diospyros Virginiana* of botanists. Very few people living north of 40° north latitude ever see a tree or even the fruit; for although the tree is perfectly hardy at least two degrees further north—and withal a very ornamental one, especially in autumn when it is covered with its golden fruit—yet, for some unaccountable reason, it seems to be scarce among collections of choice trees, especially native ornamental trees. We think it a mistaken idea that somehow seems to have taken possession of most of our landscape gardeners and arboriculturists, that our native trees are not handsome, and worthy a place in parks and other places especially adapted for them. For this reason we have selected for a subject to talk about in this number of the INDEX, the common North American Persimmon, and hope it may be a means of stimulating inquiry and observation among tree planters regarding them. Perhaps we might announce our purpose to add a native fruit department to the INDEX, which we hope to make of interest, particularly as very many of our readers never have the opportunity of seeing them growing. Most of these fruits are not considered of any commercial value, consequently are seldom seen in cultivation and only imperfectly known. We have no doubt, however, that they will all or nearly all some day be cultivated as ornamental trees, or that they will also be improved and cultivated for their fruits. We shall have them illustrated in our usual superior artistic style, and shall strive to present their claims for attention in a careful manner. We would be pleased to receive any observations and facts from others, for which due credit will be given.

There is very little probability of the American Persimmon being cultivated for its fruit for some time to come—at least in the Northern States—for the fruit has such an exceedingly sour and astringent taste until frost has eradicated it, that no pomologist will care to risk his reputation on them. However, we think it quite probable they will eventually be improved by hybridizing and cultivation, for, like all other native fruits, we often find single trees producing quite superior fruit. To illustrate this point still further, we would refer our readers to the very interesting article, by Mr. Loomis, of San Francisco, Cal., in the October number of the INDEX, on the Japanese Persimmon. Here we find a fruit naturally no better than our own, but which, by cultivation and improvement, is said to have few superiors in point of excellence, and still retain its durability and hardiness. But let us finish talking about the tree.

As a rule, all trees when growing near together or in communities, *i. e.*, forests, send up a single tall trunk, evidently seeking light and fresh air from the summit of the surrounding forest, with usually only a few, often short, scraggy branches. Now, the Persimmon is no exception to this rule, being often found 60 and 70 feet high, but like many other trees their whole nature is changed when grown alone on a lawn, or even with only a few others in a park, with plenty of light and air upon all sides. Then they seldom grow more than 20 or 30 feet high, with long, slender branches and a handsome pyramid-shaped head. It is then we think it worthy a place on our lawns and in our parks. The wood is very hard and of quite a dark color—almost black; indeed, it is really a valuable one, or would be if the tree grew a little larger, but as it only grows about 18 or 20 inches in diameter, its commercial value is somewhat impaired. But as it belongs to the valuable ebony family of trees, perhaps some day when it is better known it will be more sought after for the wood; for the fact is becoming more apparent each day, that something must soon be done to replace the wholesale destruction of timber, especially in the older settled portions of our country; and already we hear of tree planting for a future supply of timber, not only in the treeless prairies but in some of the older settled States. It is becoming quite a serious subject of inquiry among foresters as to the most valuable kinds to plant. Certainly it would be poor policy to plant anything without due regard to its future commercial value.

We have prepared an illustration (Figs. 80 & 81) of a branch with fruit and leaves attached, as they are usually seen growing, which conveys a better idea than words can do. The leaves are nearly smooth, thickish, ovate-oblong, and grow alternately on the limb. The flowers are produced in May or June, and are small, greenish, and diœcious, (*i. e.*, sterile and fertile flowers borne on separate trees), the fertile ones (Fig. 80 *a*) borne singly in the axils of the leaves; the sterile ones smaller, and usually in clusters. Fig. 80, *b*, represents a fertile flower laid open, showing the position of the stamens upon the inside of the corolla. Fig. 80, *d*, represents a single, globular, plum-like fruit, surrounded at the base by the persistent thickish calyx which remains attached to the fruit until it decays. Fig. 80, *c*, is a section across the fruit and seed, showing the eight large, flat and bony seed in their relative position. (For the use of this cut we are indebted to the kindness of Prof. Asa Gray.) Fig. 81 shows the fruit as they are seen growing upon the branch singly, but so near together that they seem to be in clusters. The fruit is very bitter and sour while green, but sweet and juicy (in the Southern States) when ripe, and of a bright orange-yellow color. In the North they are not eatable until after exposed to one or more severe frosts. But the action of the frosts is not followed by an immediate decay of the fruit, as is usually the case with fruits, but it still adheres to the tree, and, in the language of the country, is edible and good nearly all the winter. This property of preserving its edible condition for so long a period, without the aid of artificial preserving, should be an incentive for some pomologist or nurseryman to attempt their skill at improvement, and add another fruit to our list of fresh winter fruits.

There is a second American species, (*D. Texana*, Scheele,) growing in Texas, that produce a dark-brown or black fruit when ripe, that is rather sweet and juicy, but usually considered insipid. The trees are small—or, rather, they should be called large shrubs—growing in clusters, flowering in March and April, and ripen their fruit in August. (*Young's Flora of Texas.*)

B. CASE
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FROM
J.V.& S.
LONDON

NEW & RARE PLANTS

[We would request any one having new or strange Plants, to send us a notice for publication in these columns.]

MEDINILLA ERYTHROPHYLLA. GANDICHAUD.

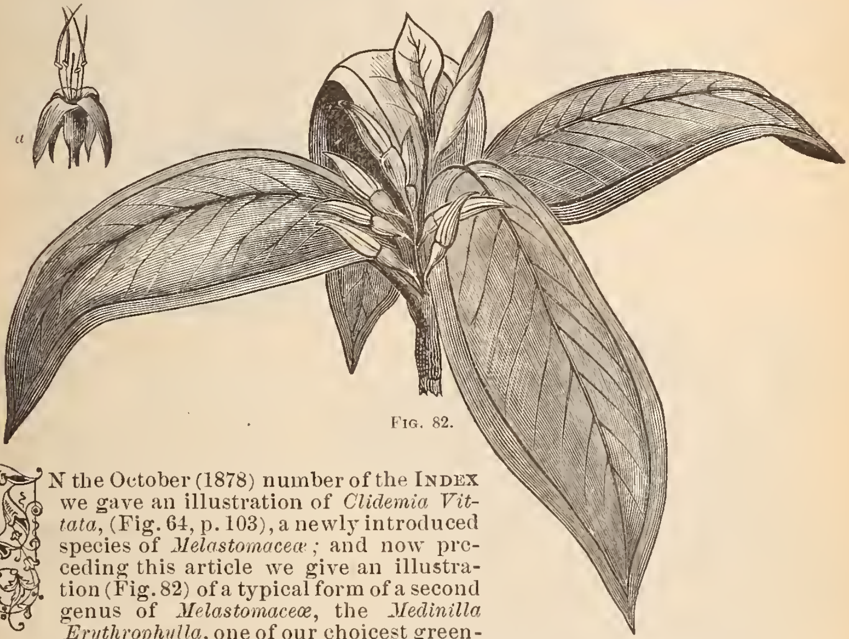

FIG. 82.

IN the October (1878) number of the INDEX we gave an illustration of *Clidemia Vittata*, (Fig. 64, p. 103), a newly introduced species of *Melastomaceæ;* and now preceding this article we give an illustration (Fig. 82) of a typical form of a second genus of *Melastomaceæ*, the *Medinilla Erythrophylla*, one of our choicest greenhouse shrubs. According to the "Treasury of Botany," there are one hundred and sixty-five genera, and about two thousand species, in the Order *Melastomaceæ;* and of all this number not one is unwholesome, while many species produce an edible fruit of great value to the indolent natives of the tropics. The same authority also informs us that there are nearly three dozen described species of *Medinilla*, all of which are from the Islands of the Indian Ocean. Sir Joseph Paxton, however, gives only six species, in the "Botanical Dictionary," (edition of 1868), all of which produce rose-colored or shaded rose-colored flowers. In their native habitat they never grow more than three or four feet high, consequently are admirably adapted for house culture. The plant has a fine, dense habit of growth; and the leaves, always growing in pairs, are quite large, with prominent ribs and veins, giving the plant a very ornamental appearance in summer, when not in bloom. The curious flowers are freely produced in clusters during fall and winter, not only from the axils of the leaves, but from the old wood at the leaf-scars along the sides of the trunk and branches of the shrubs that are often three or four years old. It is the custom of some gardeners to start all plants and shrubs growing in the spring, whether they have had any rest or not. This mode of treatment causes the *Medinilla* to bloom a little all through the summer season, to the detriment of its winter blooming.

At Fig. 82, *a*, we give a figure of a flower fully matured, and of natural size. The flowers of this species are of the softest rose-color, and remain a long time in perfection. At first the petals stand erect, partly closed, but gradually they spread out, forming a star-shaped flower; then they recurve back around the rose-colored calyx and pedicel, and remain there until they wither. In the "Treasury of Botany" we read: "The principal characters of the genus reside in the limb of the calyx, being entire, or at most obsoletely lobed, (5 divisions), and in the stamens, of which there are eight or ten, (double the number of the floral envelopes), having basal-fixed generally incurved anthers, with two lobes or spurs at the bottom in front, and one behind."

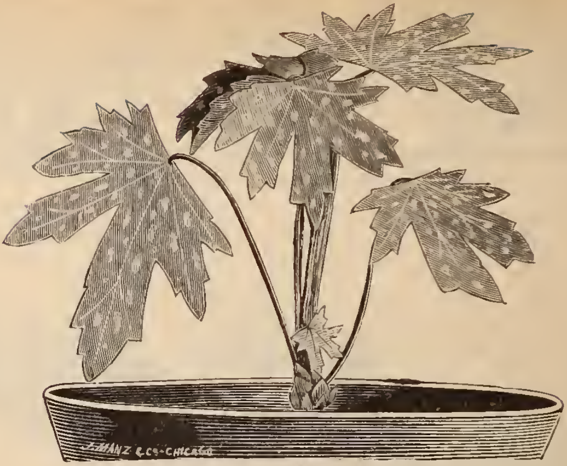

FIG. 83.

BEGONIA, "DR. STEWART."

LAST summer we prepared an article and figure of a new Begonia, raised by Dr. Stewart from seed; but as it had not then bloomed, we concluded to not publish the description until we could state the color of the flower. But now it has bloomed, and we give a figure of it here. We will give Dr. Stewart's history and description, as he has prepared it himself. He says: "Two years ago I obtained from a Dayton florist a Begonia, raised by him and called *B. hybrida multiflora denticulata*, claimed to be a hybrid of *Hybrida multiflora*, fertilized with *B. Weltoniensis alba*. Last summer I fertilized some flowers of this plant with pollen from a silver-leaved Rex Begonia, and obtained from it the accompanying plant. The plant is of a shrubby growth, (bulbous section), attaining a height of 12 to 16 inches; leaves of a deep green color, with 12 to 18 small, irregular sized, silver-white spots, distributed over the entire leaf; foliage dense; under surface of the leaf light green; stalk, leaf, stem, and young leaves, a beautiful crimson pink. Flowers white, slightly tinged pink. A very free bloomer."

The above illustration gives a very good representation of a young plant.

A NEW RACE OF BEGONIAS.

M. Braunt, of Poitiers, France, has succeeded in crossing the choice varieties of *Begonia Rex* with the shrubby varieties, and as a result has produced eight distinct hybrids, combining the habit of growth, flowers, and hardiness in the open air, of *B. discolor*, with the highly ornamental foliage of the hot-house varieties of *Begonia Rex*. This is certainly a great addition to our list of shrubby foliage plants, and will open up a new era in Begonia culture. M. Braunt has exhibited them at the most prominent French horticultural exhibitions during 1877 and 1878, and each time has received a first-class prize for foliage plants.

TWO NEW FRUITS.

E. Y. TEAS, DUNREITH, IND.

GREGG RASPBERRY.

The Gregg Raspberry originated on the hills of the Ohio river, in south-eastern Indiana, and was first cultivated by Dr. Gregg, about ten years ago, though it never attracted much attention until Mr. N. Ohmer, of Ohio, a celebrated and successful fruit-grower, noticed it in Dr. Gregg's garden, and was so much pleased with its appearance that he at once purchased plants and engaged in its cultivation on a large scale. Mr. Ohmer's success with the Gregg has been very satisfactory, and he now has ten acres of this variety planted for fruiting. That portion of his Gregg plantation that is in bearing has produced wonderful crops, and altogether the finest berries of any of the many kinds of Raspberries under culture on the same farm. Under ordinary culture, without manure or any extra care, the product of large, beautiful, luscious black berries has astonished the great number of visitors who examined them during the fruiting season, as well as the fruit dealers who disposed of the crops. No other black Raspberry is in demand while these can be obtained; and probably no other sort can be successfully shipped so far. Rev. Mr. Winchester, of Indiana, has given special attention to the cultivation of the Gregg, and fully agrees with Mr. Ohmer in his estimate of it. The Gregg will probably prove as hardy as Mammoth Cluster, or any other black cap. It ripens with Mammoth Cluster, and averages one-half larger. The seeds are very small, and the pulp possesses a refreshing sprightliness equaled by few Raspberries.

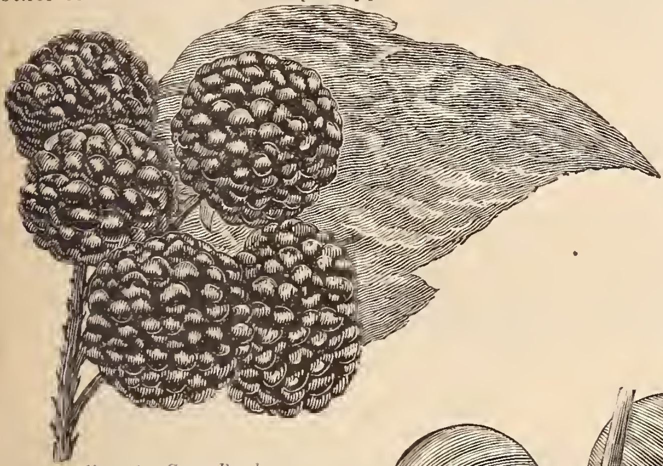

FIG. 84. *Gregg Raspberry.*
(From photograph—natural size of berries.)

SMITH GOOSEBERRY.

Thirty-five years ago the Houghton Gooseberry (a native of Salem, Mass.,) was introduced into this State. It was considered, and very justly, too, a great acquisition to our list of small fruits. It has become very generally disseminated, until it is now found in almost every garden in the central and western States. Gooseberries and Currants do not succeed so well in our southern States as further north. The quality of the Houghton is quite good, the principal objection being to its small size. Thousands of the large English Gooseberries have been imported from the old world, but they do not take kindly to our climate, which is so much drier and hotter than that of England. The first improvement on the Houghton in size was the "Mountain Seedling," which originated with the Shakers of Mt. Lebanon, N. Y. This variety has had a large sale, and continues in fair demand. About the time of the dissemination of the Mountain Seedling, Charles Downing, of Newburgh, N. Y., originated "Downing's Seedling," which sprung from seed of the Houghton. This is probably the largest and best of all our American Gooseberries: the berry is pale yellow when ripe, and of very good quality. A few years ago, Dr. Smith, of Windsor, Vermont, originated "Smith's Improved Gooseberry," which is well represented in the above cut. This plant is a strong, free grower, an abundant bearer, and the berries attain a large size —often an inch or more in diameter. They are a pale yellow color when ripe, and of excellent flavor. This is a very profitable market and family berry.

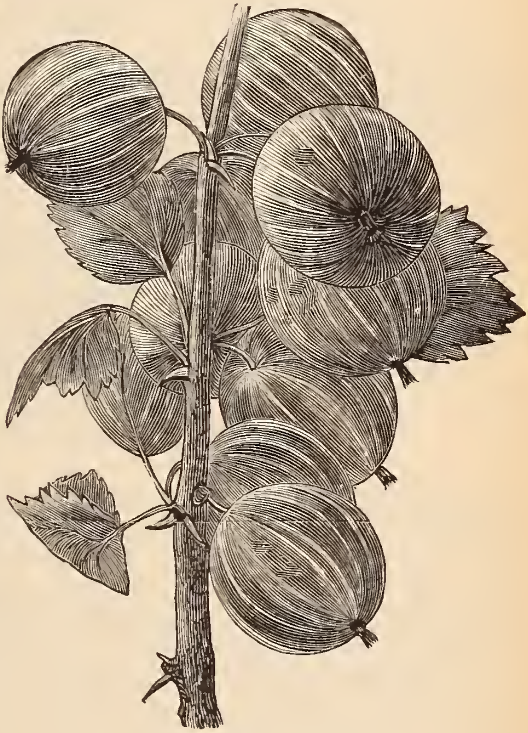

FIG. 85. *Smith Gooseberry.* (Natural size of berries.)

CORRESPONDENCE

[We solicit the privilege of publishing extracts from correspondence, of interest to the general reader. Correspondence upon Botanical subjects respectfully solicited.]

DES MOINES, IOWA, October 12, 1878.

L. B. Case, Richmond, Ind.—Dear Sir: * * * * I have a *Lilium auratum* that has shown a very beautiful variegation. The edge of the leaf is a creamy-white, that has remained constant for two years. The variegation resembles that on the *Vincas*, and is very pretty. But the extreme hot weather of last summer nearly "cooked" them out, except those that were planted very deep. All the bulbs that formed last summer are very small. * * * * I have had fine success raising the spotted *Calla (Richardia alba maculata)* from seed, and as I have never seen the process recommended anywhere, I will give it to you. When they bloom in the summer, instead of cutting off the flowers I allow them to run to seed. Each flower will produce a hundred seed, and they make saleable plants the second year. * * * * * *

Very truly, R. L. BLAIR.

BORDENTOWN, N. J., November 1, 1878.

L. B. Case.—Dear Sir: * * * * * I have made Water Lilies a hobby. I have a tank in the open air, 20 by 30 feet square, which has been a grand sight during the past summer. * * * * Some visitors have pronounced it equal, if not superior, to the Victoria Regia in point of beauty. In the tank I have growing *Nymphæa Devoniensis*, with scarlet flowers 12 inches in diameter: *N. dentata*, with white flowers; *N. scutifolia* and *stellatæ*, with the loveliest blue flowers; *N. alba*, the hardy English variety, with broad, waxy petals and a cup-shaped flower—superior in some respects to *N. odorata*—flowers pure white and six inches in diameter. I have also in my tank *Nymphæa flava*, *N. odorata*, and *N. odorata, var. obscura*, with a delicate blush flower like Lady Hume's Camellia. I have also in the tank *Nelumbium luteum*, which flowered last summer. I also have planted the seed in two localities in the State, and they are now growing—one in Salem county, the other in the Northern part of the State. I imported *Nelumbium speciosum* three years ago, but lost it. In my tank I have *Papyrus antiquorum*, and many other choice aquatic plants. In 1877 I grew the Victoria Regia in the open air, with some artificial heat, and obtained a leaf four feet in diameter. Very respectfully, E. D. STURTEVANT.

NYMPHÆA ROSEA vs. N. OBSCURA.

"**Nymphæa odorata minor.**—This is the variety named by Pursh as *rosea*, to which name it may justly lay claim, as the plant which we noticed in flower lately in the Kew collection confirmed. It is much smaller in every part than the type; it has the same dark purple color on the under side of the leaf and attenuated lobes. The blossoms, which are about 2 inches across, have the outer petals deeply tinged with rose, a color which contrasts finely with the fringe of golden stamens. Though much inferior to the recently introduced rose-colored variety of *N. alba*, it is, nevertheless, a distinct and valuable kind."—*W. in "The Garden"*.

[According to Sir Joseph Paxton, there is already a variety of *Nymphæa* with pink flowers, from the East Indies, that received the name of "*variety rosea*" in 1803, which of course must take precedence; and if the rose-colored variety of *N. odorata* is distinct enough to warrant a separation, another name must be chosen. With this idea in view, we selected the name "*obscura*" as the most suitable one for the variety, at least we think it expresses the fact as well as any name can do. All plant collectors and cultivators are aware of the disposition of plants with white flowers to produce bluish, brownish-yellow, flesh color, or pink and rose-colored flowers; while plants with colored flowers are continually producing albinos, or at least flowers many shades lighter than the usual color, the generally accepted types. The practice of multiplying species, or even varieties, upon such obscure and indefinite points, may be excused in a commercial point of view, but it certainly is a source of great confusion in botanical nomenclature.

RECENT PUBLICATIONS.

One of the greatest pleasures of our times is the abundance of valuable reading matter placed before the people, adapted alike to all classes of readers and all varieties of occupations; but as our interest is chiefly with the horticulturist and floriculturist, we can only notice those especially adapted to our department. On the pages immediately following this, we give a list of magazines, journals, and papers, published in different portions of the world, some one or more of which should be regularly subscribed for by every family, even if they have only one window in which to grow plants. The subscription price is within the reach of all; and for those whose money is of no value except for the good they receive from it, the more expensive publications are certainly a source of great enjoyment. As a rule, the most expensive are the largest, consequently contain the most information—not always, however, of the most value to those in any special line of study, for a large number of the less pretentious publications are of full as much value to the general reader as the more expensive ones. In addition to the list of papers given on page 16, we have before us—

The Aquarium, (monthly, 50 cents a year,) Cincinnati, O., devoted to the interests of the Aquarium and its wants. Each number contains several original, instructive and practical articles, of great value in the management of a fresh-water Aquarium.

The Western Horticulturist, (monthly, 50 cents a year,) Ainsworth, Iowa, is a deserving periodical of sterling qualities, and promises to be to the horticulturists of Iowa a valuable medium of communication with each other, and those interested in the development of the rich and fertile State of Iowa, in other portions of the country. It is one of that class of papers that all can afford to subscribe for, and we would be glad to know that all our friends in Iowa, especially, were its patrons.

The Valley Naturalist, (monthly, $1.00 a year,) St. Louis, Mo., is particularly designed to collect facts and information pertaining to natural history in all its branches, but more especially in the Mississippi Valley. None of the sciences are given a preference, and its columns are open to correspondence from all who may take an interest in diffusing and obtaining a knowledge of nature, as exhibited in this region.

All the old established publications, such as the *American Agriculturist*, *Gardener's Monthly*, *Bulletin of the Torrey Botanical Club*, *Botanical Gazette*, and *Vick's Monthly Magazine*, are too well known to need any comment from us. We take pleasure in saying that they are indispensable to any one interested in plant culture.

Among the new books are some of special merit, and a valuable acquisition to the horticultural library:

How to Destroy Insects, (H. F. Williams, New York city, paper, 30 cents,) is a compilation of receipts and directions for destroying all kinds of insects on house plants; while Part 2d gives much valuable instruction for treatment of insects in the flower garden (including the rose) as well as the vegetable garden. Part 3d contains many receipts for ridding the house of noxious insects, which are a source of much annoyance and no little inconvenience. It is a book well worth the money.

Winter Greeneries at Home, (E. A. Johnson, D. D., Pittsburgh, Pa., $1.00,) is full of suggestions and information for those who delight in growing plants in a window during winter; and as it is the result of the experience of a plant-lover in growing plants, its practical value will be of interest to all.

Perhaps no subject is claiming more attention from the horticulturists of the present time than the cultivation and improvement of fruit. Recognizing this great fact, Rev. Henry Loomis, of San Francisco, has prepared for publication a neat little volume, beautifully illustrated with eighteen chromo-lithographs, on the Japanese Persimmon. (Price of book, $2.00.) Mr. Loomis has perhaps paid more attention to this fruit than any other American, consequently is better prepared to tell all about the history, quality and culture of it than any one, which he has done in a clear and comprehensive style.

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For those whose fancy may run to curiosities, perhaps one of the most entertaining books lately issued is "*The Agricultural Ant of Texas*," (Rev. Henry C. McCook, Philadelphia, Pa., $4.00.) This monograph has been prepared with great care, and is illustrated by twenty-four plates drawn from nature, illustrating the ant, their habits and mode of living.

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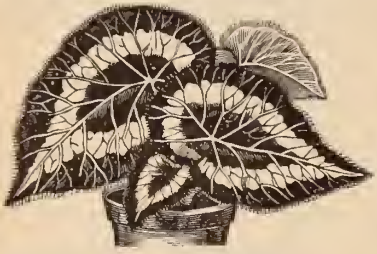

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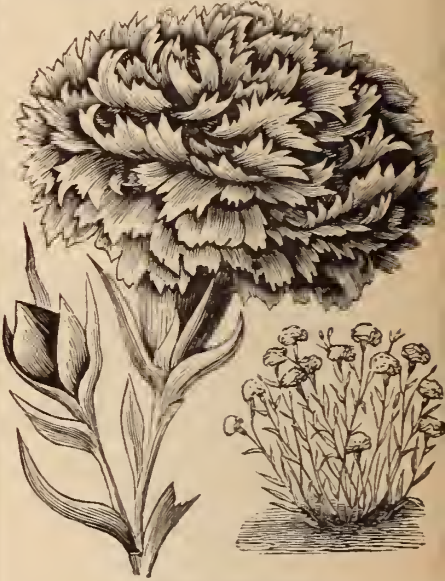

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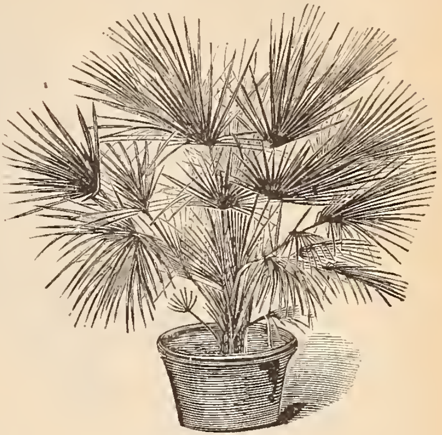
" double crimson, deep crimson	25
" " orange, flowers orange	25
" " salmon, clear salmon	25
" fulgidus, scarlet, single	35
" grandiflora, crimson scarlet	50
" kermesinus, carmine crimson	50
" lutea, double yellow	50
" miniatus, vermillion scarlet	50
" rubra plena, double crimson	50
" single red, red flowers	25
" " rose, rose colored	25
" sinensis variegata, flowers crimson	1 50
Hoya bella, small, wax-like flowers	50
" carnosa, flowers star-shaped, wax-like	25
" " variegata, variegated foliage	1 00
" Cunninghami, Phillippian Isl'nd wax plant	1 00
Hydrangea Hortensis, flowers rose color	25
" paniculata, white	50
" radiata	25
" rosea alba, white and carmine	25
" Thomas Hogg, clear paper-white	30
" variegata, green and white foliage	50
Isolopsis gracilis, hanging-basket grass	15
Jasminum grandiflorum, flowers white	25
" officinale. flowers white	25
" revolutum, yellow, very fragrant	50
Justicia alba, flowers white	25
" discolor, flowers, pink, large trusses	25
" carnea, flowers rosy-pink	25
" purpurea, flowers purplish-crimson	25
Lagerstrœmia Indica, common Crape Myrtle	25
" alba	50

	Each.
Lantana alba grandiflora, white	$0 20
“ “ perfecta, white	20
“ Adolphus Avas, canary, dark center	20
“ brillantissima, yellow and scarlet	20
“ Cobeille d'Or, pale lemon	20
“ Don Calmer, lilac, orange center	20
“ fulgens mutabilis, scarlet	20
“ Grand Sultan, scarlet	20
“ Gustave Fisher, rose and orange	20
“ Harket's Perfection, fol. yellow & green	25
“ Hutchinson, lemon yellow	20
“ Mine d'Or, scarlet, spotted foliage	20
“ Monfec, crimson	20
“ mutabilis major, dark orange	20
“ Queen Victoria, fine white	20
Laurus Tinus, flowers white, winter flowering	50
Ledenbergia rosea ænea, purple foliage	25
Libonia penrhosiensis, flowers rich crimson	30
“ floribunda, fl. scarlet & yel., in winter	25
Linum triginum, large yellow flowering shrub	25
Lonicera aurea reticulata, flowers white	25
“ Belgicum, red and yellow	25
“ Hallieana, white, changing to yellow	25
“ sempervirens, deep red and yellow	25
“ Tartarica rubra, rose color	25
Lopezia rosea, flowers rose color	25
“ mineata, flowers white	25
Lycopodium cordifolium, creeping, feathery-like	25
“ cæsium, fine creeping green moss	15
“ “ variegatum, tipped white	25
“ denticulatum, steel-blue creep. moss	20
“ Hugelii, erect, plume-like	25
“ involvens, dwarf, feathery-like	25
“ lepidophylla, Resurrection Plant	50
“ Poultieri, creeping	25
“ Wildenovia, erect, fern-like	50
Mahernia odorata, flowers yellow	25
Manettia cordifolia, flowers bright scarlet	25
Maurandia Barclayana, house vine	20
Medinilla erythrophylla, [see Fig. 82, p. 11,]	50
Mikania scandens, fast growing vine	15
“ speciosa, variegated climber	25
“ violacea, creeping vine, variegated fol.	25
Mimulus moschatus, (Musk Plant)	25
Myrtus communis, flowers white	25
Nierembergia gracilis, white, purple and violet	15

Oleander, or Nerium.

Nerium album, old single white variety	20
“ atro-purpureum, double purple	50
“ atro-sanguinea, double scarlet	50
“ de Brun, double, carm.-lake, striped white	75
“ duplex, semi-double white	25.
“ Dreer's double white	50
“ flavum duplex, double yellow	40
“ Giaut des Battles, double scarlet	30
“ Gloriosum, double pink-carmine	75
“ Henri Mares, rose edged carmine, fragrant	60
“ Henri Sahut	50
“ lutea, light straw color, double	50
“ Madoni grandiflora, double white	50
“ Paul Sahut	50
“ Prof. Durand, double white and yellow	75
“ rosea, old double pink variety	25
“ splendens, large, double, dark pink	30
“ Such's New Double White	75
Olea Americana, the American Olive	50
“ fragrans, fragrant white flowers	50
Othonna crassifolia, a pretty basket plant	25
Pandanus gramnifolius, grass-like	50
“ Javanicus variegatus, white variegat'n	2 50
Palm, Brahea fillimentosa, (Pritchardia filifera)	2 00
“ Carludovica palmata	1 00
“ Caryota urens, Fish-tail Palm	50
“ Chamarops excelsa, or Fortuni	50
“ “ humalis	50
“ Curculigo recurvata	30
“ “ variegata	3 00
“ Phœnix dactylifera, (Date Palm)	50
“ Sabal recurvata	50
[Specimen plants of 15 varieties at special prices.]	
Panicum plicatum vittatum, choice grass	30
“ variegatum, for baskets	20
Passiflora alba, flowers pure white	25
“ Colvilli, flowers light blue	25
“ decaisneana, blue, red and purple	25
“ incarnata, purple, (hardy)	25
“ trifasciata, variegated leaf	30
Pedilanthus tithyroloides, Slipper Plant	30
Peperoma arlfolia, green and white leaves	25
	Each.
Peperoma maculosa, green and white	$0 15
“ magnoliafolia, large green leaves	25
“ procumbens, trailing	15
“ resedæflora, white, winter flowering	25
“ velutina, green and purple	15



Chemærops Excelsa.

Periplocea græca, flowers purple, hardy	$0 25
Peristrophe angustifolium aurea variegatum, mauve flowers	25
Petunia alba excelsior, clear white, double, frag't	25
“ American Belle, mauve and crimson	25
“ Bermaid, violet and white	25
“ Queen of the Valley, white and velvety	25
“ Sovereign, rosy-purple, blotched white	25
“ Snowball, pure white, very large, double	25
Phlox decussata	25
“ procumbens, an old variety	15
“ subulata, moss pink	15
Philodendron pertusum, tropical fruit plant	2 00
“ pinatifidum	1 00
“ princeps	1 00
“ Lindeni	2 00
Phormium tenax, New Zealand Flax	50
Physianthus albens, flowers white	25
Pilea repteus, minute pink, star-shaped flowers	15
“ arborea, erect growth	15
“ muscosa, erect growth	15
Piper nigrum, black pepper vine	25
Pittosporum Tobira, winter flowers	25
“ “ variegatum	40
Plumbago capensis, flowers azure blue	50
“ larpentæ, flowers indigo blue	25
“ rosea, flowers rose color	35
“ Zeylanica, flowers, pure white, waxy	25
Poinsetta pulcherima, winter flowers, scarlet	25
Polygonum reflexum	15
“ Sieboldi, hardy, [Bot. Ind., Fig.54,]	35
Pothos microphylla	3 00
“ longifolium	75
Punica granatum, flowers single, red	50
“ “ alba pleno, double white	50
“ “ rubra pleno, double, red	50
“ “ James Vick	50
Puya Altenstenii, tropical epiphytes	50
“ recurvata	50
Rhodiola rosea, hardy, echeveria-like plant	25
Rhyncospermum jasminoides, choice climber	25
“ “ variegata	50
Rivina Braziliensis, fine for house culture	30

Roses.

Hybrid Perpetuals. (50c. each, unless noted.)
Beauty of Waltham, rosy carmine.
Belle of Normandy, lavender, large, full, fine.
Deuil de Prince Albert, dark crimson, large, fine.
Duke of Wellington, brilliant crimson, large, full.
Duplessis de Mornay, brilliant crimson.
Gen. Washington, brilliant rosy carmine.
Gen. Jacquiminot, brilliont scarlet-crimson, superb.
Giant of Battles, brilliant crimson, full, very sweet.
George Prince, dazzling red, shaded with rose.
Jenny Perrick, light pink.
La France, satin pink, outer petals pale flesh, 75c.
La Reine, rosy lilac, very large.

Lady Emily Peele, white, tinted crimson, fine.
Madam Charles Wood, brilliant red. 50c.
Madam de Stella, bright rose, large, full and fine.
Perle Blanches, white, slightly tinted carmine, 75c.
Prince Eugene Beauharnais, brillint reddish-scarlet.
Souvenir de Charles Montault, vivid red.
Souvenir de Lady Eardly, deep rosy crimson.
Souvenir de William Wood, blackish maroon.
Triomphe de Versailles, light rose, beautif'ly cupped.

Bourbon Rose. (40c. each.)

Appoline, delicate pink.
Hermosa, pink, one of the finest.
Henri Plantier, bright rose, large.
Imperatrice Eugene, beautiful pale rose.
Louis Odier, bright rose, full and free flowering.
Marechal Villiars, violet rose.
Queen of the Bourbons, rich blush.
Reine Victoria, soft rose, flowers medium size.
Souvenir de Malmaison, clear flesh color, edges blush.
Verdiflora, or Green Rose, flowers green.

Bengal, China, or Daily Roses. (25c. each.)

Abbie Moiland, dark rosy crimson.
Archduke Charles, rose, changing to crimson.
Cels, bright red, constant bloomer, showy, hardy.
Ducher, pure white, medium size, flowers freely.
La Phœnix, rich rose color.
Mrs. Bosanquet, pale flesh, excellent.
Purple Crown, rich dark crimson, very free bloomer.
Pink Daily, light pink, constant bloomer.
Sanguinea, dark crimson, good pot rose.
Vesuvius, dark velvety-crimson, free.
White Daily, creamy-white, fine, profuse bloomer.

Tea-Scented. (35c. each, unless noted.)

Archduchess Theresa, creamy-white, yellow center.
Bon Silene, carmine, shaded orange, winter flow'ng.
Catherine Mermet, flesh-colored rose, large.
Cels, flesh color.
Countess La Bath, rosy-salmon, shaded amber, fine.
Devoniensis, pale yellow, very large, superb old rose.
Duchess de Brabandt, rosy-blush, shaded amber.
Glory de Dijon, yellow, shaded flesh color.
Homer, rose, tipped with red, salmon center.
Isabella Sprunt, creamy yellow, fine for bouquets.
La Pactole, cream, center lemon-yellow, large, full.
La Tulip, creamy white, tipped crimson, 50c.
Madam Bremond, bright red, tinged purple.
Mad. Celina Noirey, shaded rose, backs of petals red.
Mad. de Narbonne, pale blush, fine, large, free.
Mad. Villermoz, white, center salmon, large, full.
M'lle Rachel, white extra fine, full bloomer.
Marechal Neil, deep yellow, large, sweet scented, $1.
Melville, deep rosy blush.
Safrano, bright apricot in bud, changing to buff, extra winter bloomer.
Triomphe de Luxemburg, coppery rose.
White Tea, pure white, very fragrant.

Noisette. (25c. each, unless noted.)

Augusta, bright yellow, large, good winter bloomer.
Celine Forestier, deep canary-yellow, good size.
Caroline Marniesse, white, pink center, in clusters.
La Marque, white, tinged with lemon-yellow, fine pillar rose.
Reine de Massifs, fine salmon-yellow, new.
Setina, dark pink, very desirable, free bloomer.
Solfaterre, beautiful sulphur yellow.
Washington, white, flowers freely in clusters till frost.
Woodland Margaret, pure white, free bloomer.

Moss Rose. (50c. each, unless noted.)

A Feuilles Pourpes, (A.) bright red, distinct, 75c.
Blanche, (Perpetual White Moss,) pure white, blooming in clusters, 75c.
Capt. Ingram, (A.) purplish-crimson, violet shade.
Crimson, (Old English Moss,) light crimson, large.
Duchess de Istra, (A.) light rose, free bloomer, fine.
Henry Martin (A.) brilliant carmine.
Muscosa minor, (A.) deep rose, free bloomer.
Precocæ, (A.) deep pink, mottled, early bloomer.
Princess Adelaide, (A.) pale, glossy, rosy lilac.
William Lohb, (A.) velvety crimson, shaded purple.
White Moss, (A.) flowers white, large, double.

Microphylla, or Red Burr Rose, blush or rose color, 25c.
Microphylla, or White Burr Rose, creamy white, 30c.
Microphylla, Premier Essai, flesh col'r, crim. center 50c.

Musk Rose.

Herbemont Musk Cluster, creamy white, frag'nt, 40c.
White Musk, hardy climbing rose, pure white, 40c.

Climbing Roses. (25c. each, unless noted.)

Baltimore Belle, blush, becoming white, immense clusters, 50c.
Mrs. Hovey, blush white.
Prairie Gem, bright crimson, blotched white, 50c.
Prairie Queen, deep rose, strongest and most hardy.
Russell's Cottage, very rich, crimson shaded.

Hardy Garden Roses.

Mad. Plantier, pure white, fine for cemetery, 35c.
Scotch Rose, (William the Fourth,) white, often shaded red, 25c.

	Each.
Ruella formosa, crimson flower	$0 25
“ maculata, spotted leaf	20
Russellia juncea, flowers crimson	25
“ floribunda	40
Saccharum Maddeni, Pampas Grass	25
“ violaceum, not hardy	75
Salvia involucrata, flowers rose color	25
“ leucantha, light blue flowers, white tips	25
“ Mrs. Stephens, deep crimson maroon	25
“ purpurea, purple, fol. & stems silver grey	25
“ rosea, rose color	15
“ splendens, bright scarlet	25
“ “ variegata, scarlet fol. variegated	35
Salvia splendens Soucheti flora alba, pure white	20
Sanseviera Javanica	50
“ Guineensis	2 00
“ Zeylanica	2 00
Sanchezia nobilis variegata	25
“ spectabilis variegata	25
Sedum carnea variegatum	25
“ glaucum	25
“ hypnoides	15
“ Japonicum	25
“ Sieboldi	25
Senecio macroglossus, rapid climber	25
“ scandens, rapid climber	15
Scindapsus pictus	50
Silphium laciniatum, (Compass Plant)	25
Smilax, myrsiphyllum asparagoides	50
Solanum Jasminoides, winter flowering climber	25
“ “ variegata	30
“ pseudo capsicum, (Jerusalem Cherry)	15
Sollya heterophylla, blue flower	50
Statice lanata, flowers pale lilac, hardy	20
Stevia compacta, flowers pure white, large tufts	25
“ rosea, flowers with a tinge of rose	25
“ seratifolius, small white flowers	25
Torenia Asiatica, azure blue flow's, tipped violet	25
“ fournerii, tall growing	25
Thunbergia alata alba, flowers white	50
“ aurea, flowers yellow	50
Tradescantia aquatic, suitable for baskets	20
“ discolor, flowers white	25
“ latifolia	15
“ repens, creeping variety	15
“ “ vitata	25
“ zebrina, purple and green leaves	15
Urtica microphylla, a choice lawn shrub	50

VINCA.

Erect Varieties.

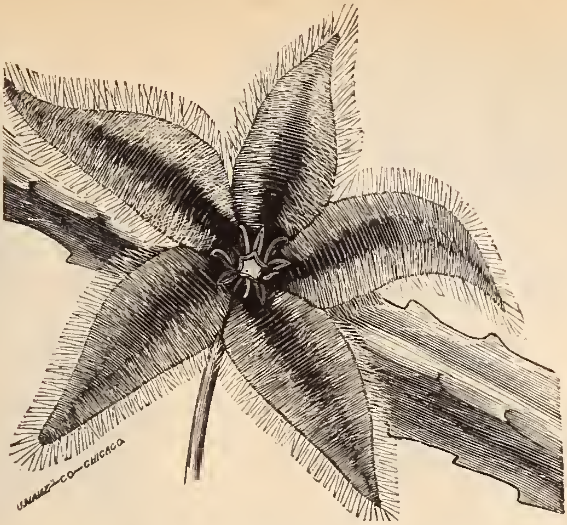
Vinca alba, flowers pure white	25
“ occulata, pure white with pink eye	25
“ rosea, flowers rose color	25

Trailing Varieties.

Vinca aurea reticulata	20
“ major, flowers blue	15
“ minor, flowers blue	15
“ “ alba, flowers pure white	20
“ “ aurea variegata	25
“ elegantissima, flowers large, blue	25
“ Harrisonii, flowers light blue	25

Violet Maria Louise, double lavender	25
“ Neapolitan	15
“ Victoria Reginæ	25

Yucca aloefolia, Spanish Dagger	35
“ filamentosa hardy	50
“ flaccida, from California	1 00
“ gloriosa	50
“ “ variegata, white edged leaf	2 00



Stapelia Asteria.

Succulent Plants.

	Each.
Agave Americana, Century Plant	$0 25
“ “ variegata	50
“ Applanata, dwarf growth	1 00
“ Sislandi	35
“ Yuccafolia, narrow leaves	1 00
Aloe alba picta, large growth	30
“ aspersa, small growth	50
“ Cooperii, large growth	1 00
“ latifolia, spreading growth	1 00
“ lingua	50
“ Margaritifera	50
“ serratifolia, Tree Aloe	25
“ soccatrina obliqua, small growth	30
“ “ umbellata, “	30
“ variegata, Partridge Breast Aloe	75
“ verrucosa, warty surfaces	25
Bryophillum calcienum	25
“ petiliana	25
Cacalia articulata	25
“ glauca	25

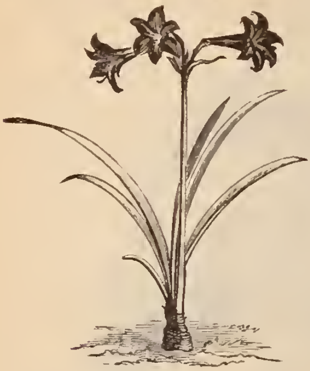
CACTUS.

	Each.
Cereus crenatus, night bloomer	1 00
“ cylindricus, day bloomer	50
“ erisophorus	1 00
“ grandiflorus, night bloomer	30
“ longissimus, night bloomer	30
“ McDonaldii, night bloomer	50
“ monstrosa	25
“ “ formosa	40
“ paucispinus	50
“ repens, magenta colored flowers	35
“ serpentinus, violet flowers	25
“ speciosa	30
“ tortuosa	1 00
Echinocactus multiplex, white flowers	25
“ Eyresii, white flowers	25
“ Emoryii	50
“ ottonis, yellow flowers, pink pistils	35
Epiphyllum Ackermanii, flowers rosy pink	25
“ phyllanthoides, flowers scarlet	25
“ truncatum crenatum, flow. crimson	25
“ “ violaceum, flowers violet	25
Mammillaria gracilis	25
“ pusilla	25
“ stellata	25
“ sphœrica	25
“ Shiediana	25
“ Tenuis	25
Napalia cochinilliffera, cochineal plant	50
Opuntia alba spina	25
“ arborescenes	25
Opuntia Braziliensis	$0 25
ficus Indica, flowers yellow	25
“ microdasys	35
“ Missouriensis, flowers yellow, hardy	25
“ rafinesquii, yellow flowers, hardy	25
“ rufida, yellow flowers	50
“ vulgaris, yellow flowers, hardy	25
Piloceras Hookeri, flowers white	50

	Each.
Cotyledon orbiculata	25
“ coruscans	15
Crussula arborescens, flowers roseate	25
“ ciliata, flowers white	25
“ albicans, large leaf variety	25
“ gracilis	15
“ lactea	15
Echeveria grandiflora, large growth	20
“ metallica, large handsome leaves	50
“ pulverulenta, covered with white dust	50
“ retusa, silvery leaves, edged pink	30
“ “ floribunda, silvery leaves	30
“ rotundifolia, small foliage	25
“ sanguinea, violet shaded foliage	15
“ scaphylla	25
“ secunda, green leaves	15
“ “ glauca, silvery leaves	30
Euphorbia pendula	25
Hechtea Ghiesbreghtii	1 00
Mesembryanthemum amabilis, flowers yellow	15
“ barbatum, flowers pink	15
“ cordifolium, flowers pink	15
“ variegatum	25
“ dolabraform	15
“ pinnifolia, flowers scarlet	25
“ “ alba, flow. white	25
Pachyphytum bracteosum, silvery leaves	25
“ Hookerii, silvery leaves	25
Rochea falcata, silvery white leaf	30
Sempervivum arachnoideum, flowers rose-color	25
“ arboreum, not hardy, golden	25
“ tabuliform, not hardy, yellow	25
Senecio pentasitus, Candle Cactus	20
Stapelia asterias, erect growing	50
“ deflexa, trailing	25
“ mixta, tall growing	35
“ normalis, trailing	25
“ serpentina, trailing	25
“ “ variegata	25
“ Woodfordiana, trailing	25
“ grandiflora, erect growing	50
“ glomereta, erect	50
“ ribonium, erect	50

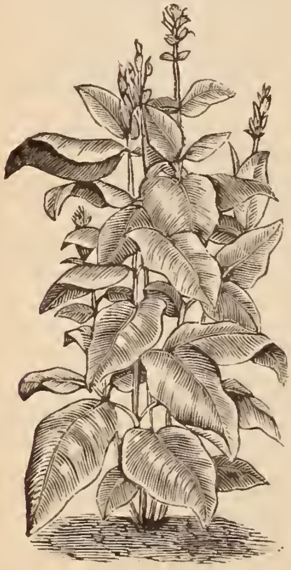
Bulbous Rooted Plants.

	Each.
Agapanthus umbellatus, African Blue Lily.	$0 50
Alocasia atropurpurea, purple stems	50
" Javanicum	50
" odorata, large erect leaves	50

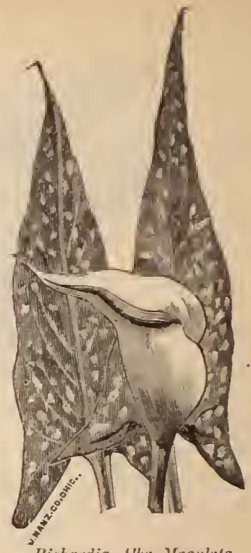


Amaryllis Regina.

Amaryllis alba, flowers long, tube-shaped	75
" atamasco, pink flowers	25
" aulica, orange-scarlet, striped green	1 00
" formosissima, rich velvety scarlet	35
" Johnsonii, crimson, striped white	75
" lutea, pink	25
" Prince of Orange, yellow flower	1 00
" regina, scarlet, striped white	1 00
" rosea, trumpet-shaped	75
" Treatii, dark pink	25
Amorphophallus Rivierii, spotted stems	75
Caladium albonervium	30
" Alphonse Karr	50
" Beethoven	1 00
" Brogniartii	50
" Duc de Ratibo	50
" Max Kolb	75
" pœcile	75
" Sedenii	1 00
" Wightii	50
Calla Ethiopica, Lily of the Nile	50
" " nana, dwarf	40



Canna Brenningsii, foliage green and yellow	50
" discolor, flowers scarlet	25
" gigantea, flowers scarlet	25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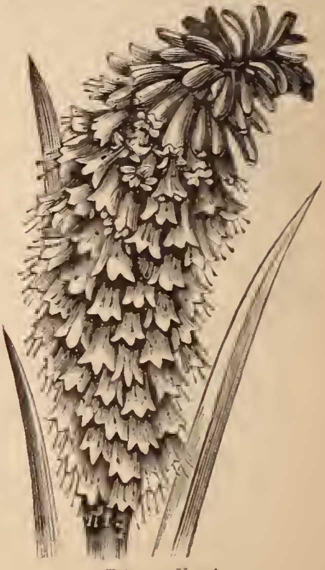
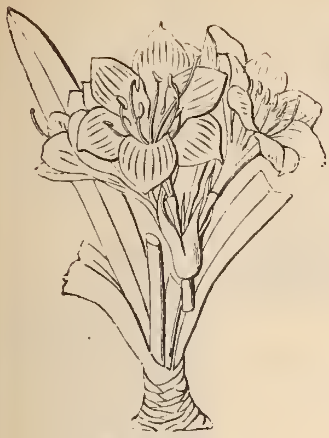
Richardia Alba Maculata.

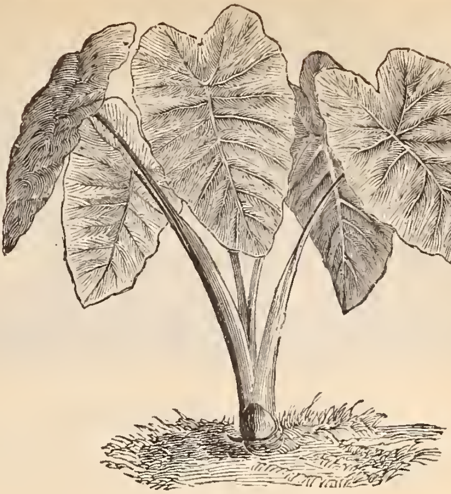
	Each.
Canna Marechal Vailliant, purple foliage	$0 25
" Ne Plus Ultra, violet foliage	25
" nigricans, foliage rich bronze	25
" Pius IX., large yellow flowers	25
" porleana, leaves shaded purple	25
" Promice de Nice, free bloomer, flo. yellow	25
" rubra superbissima, winter flowering	35
" spectabilis, green foliage, cherry flowers	20
" tricolor, foliage green, yellow and red	50
" Warczewiczii, bronzy-green foliage	25
" " rosea	25
" zebrina, zebra-striped foliage	25
" " nana, dwarf variety	25
Colocasia esculentum	30
Convolvulus palmatus, rapid growing vine	25
Crinum amabile	5 00
" Americana	50
Eucharis Amazonica, Amazon White Lily	75



Tritoma Uvaria.



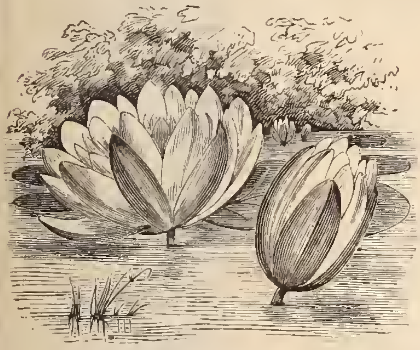
Vallota Purpurea.



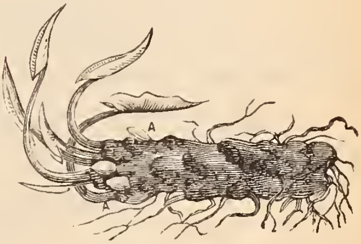
Caladium Esculentum.

	Each.
Gladiolus, all colors mixed............$1.00 per doz.	$0 10
Imatophyllum grandiflorum	1 00
Maderia Vine, rapid climber	15
Musa Cavendishii, (Banana,) flowers scarlet	6 00
" Paradisiaca, true Plantain tree, flow. pink	1 00
" rosacea, flowers pink, fruit orange color	1 00
" sapientum, true Banana, fruit yel., fl. pink	1 00
Oxalis alba, white	20
" Bowieii, flowers pink	25
" multiflora, flowers blue	25
" ortgiesi, violet-purple foliage	25
" rosea, flowers roseate	25

	Each.
Oxalis versicolor, white, crimson striped	$0 25
" violacea, hardy, flowers violet-purple	15
Pancratium fragrans, pure white flowers	2 00
" grandiflorum, white flowers	2 00
" rotatum, white flowers	2 00
Richardia alba maculata, spotted Calla	25
Tritoma uvaria, Red Hot Poker plant	25
Tritonia aurea, flowers orange-scarlet	20
Tuberose, double-flowering	15
" Pearl, dwarf	20
Vallota purpurea, flowers dark crimson	50



Nymphæa Odorata.



Root of N. Odorata.

Aquatic Plants.

	Each.
Cyperus alternifolius	$0 25
" " variegata	50
Iris Japonica	25
" hexagona	25
Nelumbium luteum, (Lotus)	1 00
Nuphar advena, hardy	50
Nymphæa flava and N. odorata	1 00

	Each.
Papyrus antiquorum	$1 00
Pontideria cordata, hardy	30
Richardia Africana, (Calla)	25 to 75
" alba maculata	25
Sagittaria, in variety, hardy	25
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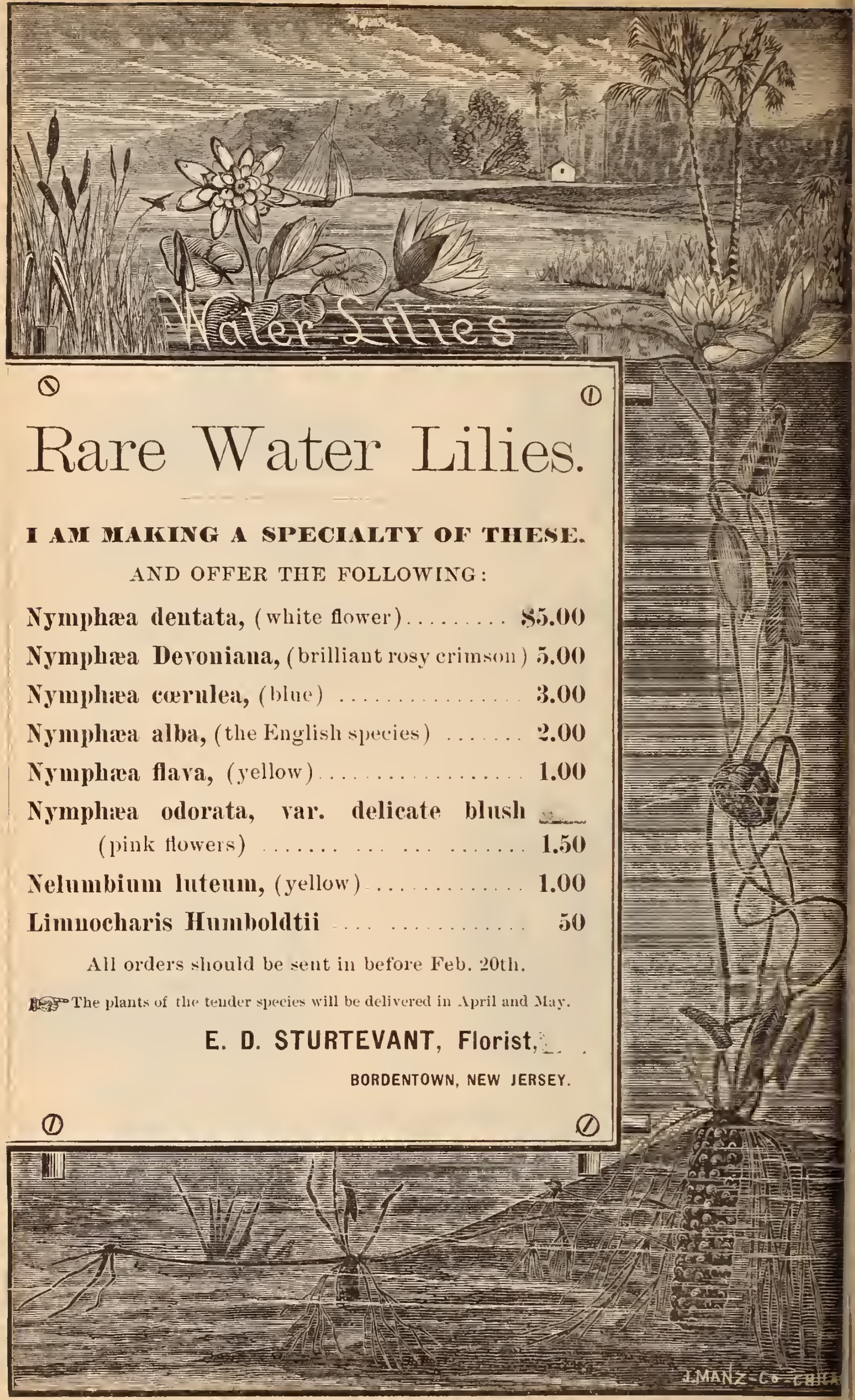

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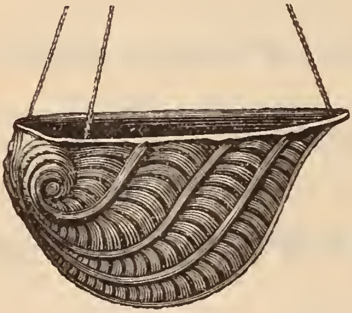

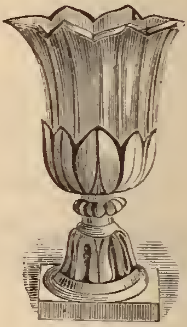

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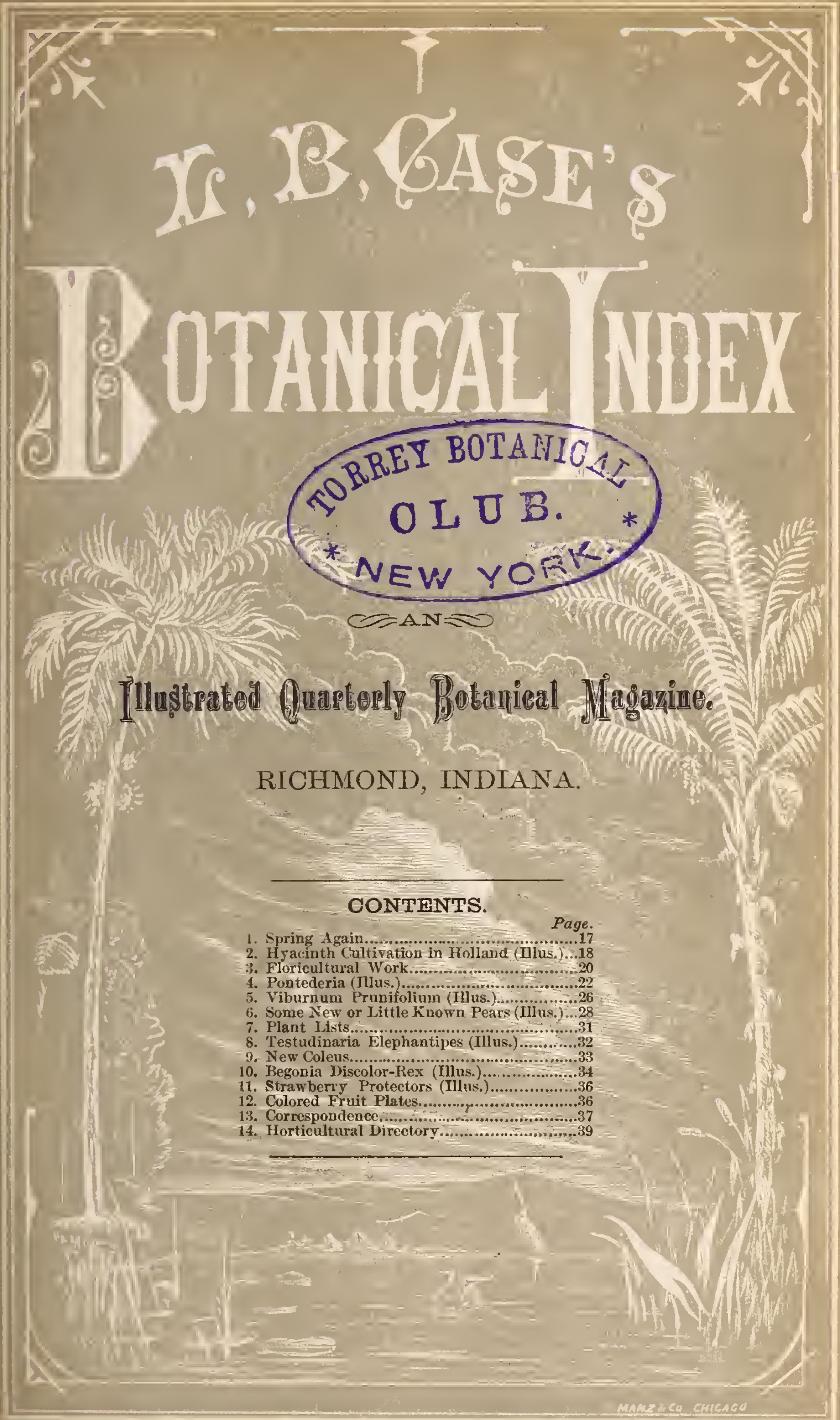
Vol. II. APRIL, 1879. No. 2.



L. B. CASE'S
BOTANICAL INDEX

TORREY BOTANICAL
CLUB.
* NEW YORK *

AN

Illustrated Quarterly Botanical Magazine.

RICHMOND, INDIANA.

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L. B. CASE'S BOTANICAL INDEX

AN ILLUSTRATED QUARTERLY BOTANICAL MAGAZINE.

TORREY BOTANICAL CLUB. NEW YORK

VOL. 2.—NO. 2. RICHMOND, IND., APRIL, 1879. Published Quarterly, at 25 Cents a Year.

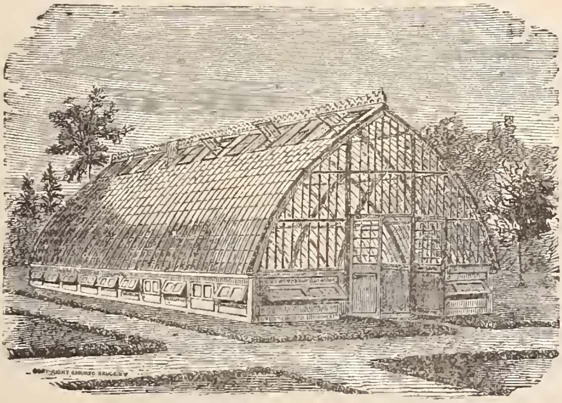


FIG. 86.

SPRING AGAIN.

ONCE more the warm and genial sunshine announces the near approach of Spring-time, with the accompanying enjoyment of sweet singing birds, and a still more welcome return to life and vigor of a dormant vegetation. But these returning pleasures are nowhere more fully appreciated and welcomed than by the people living within the temperate zone, and especially so, after such a cold and severe winter as the one just passed; for old Boreas ushered in the new year of 1879 with a terrible howl throughout the whole northern hemisphere, and as a sequence the vegetable kingdom, unless well protected, is a great sufferer from his fearful blasts.

In the last number of the INDEX, which was issued during the severe weather in the middle of the winter, we gave an illustration of a Winter Flower Garden (greenhouse) in the temperate zone during winter; which, however, can only be enjoyed by comparatively a few. And at the head of this article we give an outside view of one of the many good designs for a large Conservatory, which also suggests the fact that we must no longer confine ourselves to the greenhouse or window garden for our floricultural work, but must move outside to prepare for summer. There is only a very short time in spring suitable for certain kinds of work to be done, and when it is not done at the proper time it is usually equivalent to labor lost. Trees, shrubs, and many kinds of vines, must be planted early to enable them to get a start before the hot, dry weather; or, if they are to be only pruned, (not replanted), it should be done before they start. Buildings and fences must be repaired or repainted; the lawn must be cleaned and often enriched; the flower beds must be arranged, and the vegetable garden must be prepared and many things planted early. In fact, there is more work to be done in March, April and May, than can be done at all satisfactorily by the majority of our people.

HYACINTH CULTIVATION IN HOLLAND.

BY C. E. VAN GOOR, HAARLEM, HOLLAND.

AMONG the flowers we keep in our rooms during the long, cold winter, certainly the Hyacinth belongs to the most beloved ones; therefore, I hope to please the readers of Mr. L. B. Case's BOTANICAL INDEX by trying to give them an idea how Hyacinths are grown in Holland.

Years ago, when the Hyacinths were still so high in price that they were only to be had by the rich, there were just a few gardens around Haarlem where these bulbs were grown, and the stock was small at that time. Since the railways and steamers go direct to nearly every part of the world, the nurserymen of Haarlem are producing more stock, and have arranged new nurseries for this valuable plant, so that at present in spring the country around Haarlem for many miles to the north and south, is in reality a flower garden. The nurseries generally lie along the dunes, (low sand hills), and the soil is almost pure sand, varying in color from white and yellow to brown and grayish black, which great difference enables the nurserymen to give the Hyacinth every year a different and at the same time a quite fresh soil. During the winter, those places where Hyacinths are to be planted next autumn, are spaded three and sometimes even five feet deep, in order to bring the soil in which the Hyacinths have grown one year, down deep in the ground, and also to get a fresh soil on the surface. In March and April the soil is enriched with only cow manure, after which vegetables or potatoes are planted, and it is dug again in autumn about fifteen inches deep before it is ready for the Hyacinth.

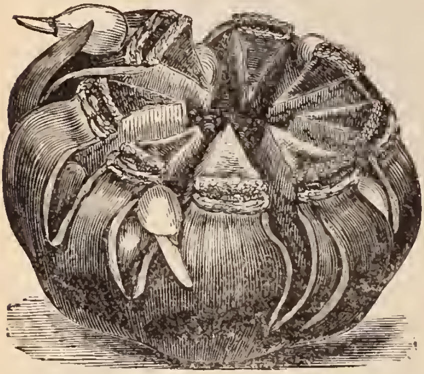


FIG. 87.

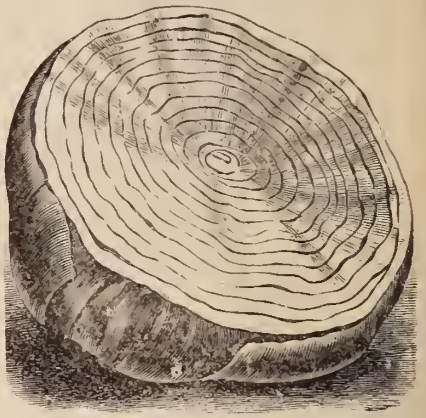


FIG. 88.

[For the use of these four cuts (Nos. 87, 88, 89 and 90) we are indebted to the kindness of James Vick, who prepared them for use in his "Floral Guide," (No. 3, 1877,) from specimens selected by himself while on a visit to Holland.—L. B. CASE.]

By the last of August the nurserymen begin planting the bulbs, in oblong, rectangular beds, about 3½ feet in width—the depth varying according to the different ages of the Hyacinths, and to the color of the ground, as also to the height the soil lies above the level of the water.* By the end of November all the Hyacinths are covered with reed, (mulching), about one inch thick, which reed is taken away in February or March, when frost is over; and if the leaves which are now just coming out of the ground look yellow, they are lightly covered again till they are quite green, when the reed is taken away.

About the 15th of April generally the Hyacinths are in bloom. It is at that time the environs of Haarlem present that splendid sight for which it is renowned. Flowers everywhere, and when there is no wind the air is filled with their rich perfume. I do not think there is a place in the world that ever offers such a sight. When the flowers begin to wither, they are all carefully cut off in order to prevent the bulb from becoming too much exhausted, and are strewed over the land where potatoes are planted to prevent the sand from being blown away by the winds. This bed of flowers is also of great benefit to the land, as there is some manure in it.

---

*Nearly all the splendid Hyacinth and Tulip grounds around Haarlam are the beds of what were once arms of the sea, reclaimed by a series of dykes and ditches. The lower grounds are still affected by the sea—some portions of the year, however, more than others.

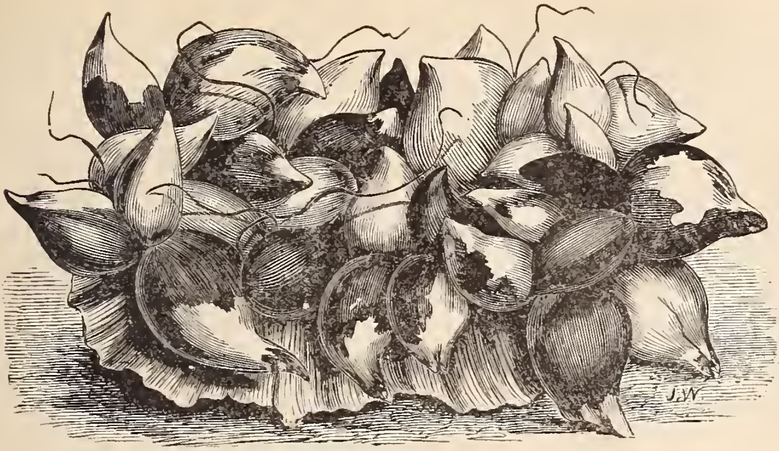


FIG. 89.

Directly after the flowers are cut off, the bulbs begin to grow; the leaves erect themselves and get taller. The weather during May and June decides whether there will be a good crop or not. For the last two years the Hyacinths have been badly injured during these months by honey dews* and storms, so that it will require at least one good season to bring the stock up right again.

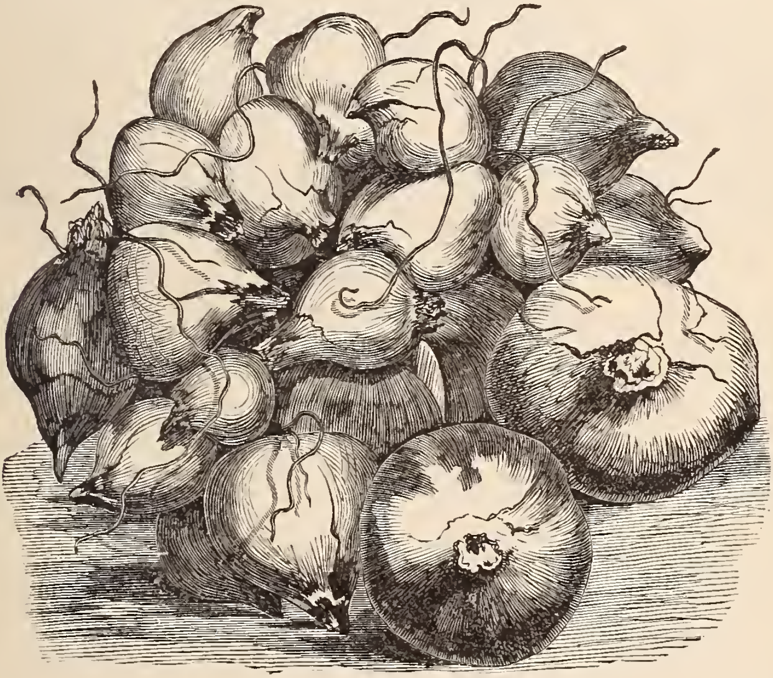


FIG. 90.

About the last of June the nurserymen begin to take the bulbs out of the ground, and this is the time to multiply them, which is done in these two different ways: Coming fresh out of the ground, the bottoms of the oldest and largest bulbs are cut into six or eight equal parts, about the thickness of the height of the bulb; this mode of cultivating is called "crossing." [Fig. 87.] Next year the old bulb is gone (de-

---

*In most cases "honey dew" is the sweet secretions of *Aphides*, or perhaps other plant lice. But there are some cases wherein it is clear no insects have had any agency in the matter; and these cases are supposed to be due to sweet exudations from the leaves themselves, just as sugar is formed in the sap of the sugar maple during the winter season. But just how the plant does it has not been made known, that we are aware of.—*Gardener's Monthly, March*, 1879.

cayed,) and on the separated parts of the bottom of the bulb, between the shells, about twenty young ones are grown, [Fig. 89]. The small bulbs got in this way require four years before they are large enough to be sold or to be crossed again.

The other way of cultivating is called, in Dutch, "hollowing," (or in our English conversation we should say, "scooping out,") which means, to make a hole. Probably the reader knows that a Hyacinth consists of several shells arranged like an onion, coming together at the bottom, and in the center of which is the flower. By the end of July, when the weather is fine and dry, this bottom is carefully cut out, so that nothing is left but the shells, [Fig. 88]. The bulbs being severally wounded, are put in the draft or sunshine to dry. After two or three weeks, when the wound is quite dry and hard, a great many small, white knobs may be seen near the dry part of the shells; and being planted in autumn of next year, all these knobs will become very small young Hyacinths, [Fig. 90,] that do not bloom for two or three years, and take six, and sometimes even eight, years to grow to the ordinary size. By this way of cultivating, one bulb produces from 60 to 150 young ones.

Next year the young ones are separated, when crossed, or picked off the old dry shells in the other way of cultivating; planted quite free in autumn, and lifted again in June—so on for several years, which depends upon the sort growing fast or slow—until the bulb is old enough for the market, or to be used for cultivation. By applying these methods of cultivation every year, different stocks are obtained, which are treated according to their age. The Hyacinths, after being all lifted, are buried again in the earth in order to let the roots die off, and to enable the bulb to close itself, (ripen). After a fortnight they are taken out again, and dried for an hour or so in the sunshine; then sifted to get the sand away, and brought into the bulb house, where they are laid out on wooden tables in the draft—for the windows of a bulb house are only shut when the weather is damp.

By the end of July or beginning of August, the bulbs are sent out; so everybody may comprehend that it is necessary to send in their orders for flower roots by the beginning of July. New sorts of Hyacinths are got from seed, which takes a very long time, as the grain of seed wants eight, sometimes even ten, years to grow, until the bulb is large enough to produce a good flower; and then the grower possesses only a single bulb. So my readers can comprehend what a long time it requires, as well as the great cost, to secure a stock of such novelties.

I hope this simple description of the cultivation of the Hyacinth may be acceptable to the readers of the INDEX, and if any one wants further information, I am always ready to give it. On the other hand, I request the favor to receive the address of every dealer in America who takes an interest in bulbs, written on postal card, to enable me to complete my list of addresses, and to send out my wholesale catalogue of Dutch bulbs and flower roots, which is published every spring.

FLORICULTURAL WORK.

BY I. B., MANCHESTER, ENGLAND.

SPRING AGAIN,

AND to no one does this mean more than to the nurseryman, florist or garden-[illegible] Cold, rigorous winter gone, the worker amongst plants and flowers takes breath for a little while, after the strain upon his watching powers during the severe winter weather; but the pause is only temporary. We must again brace ourselves for many duties which need almost instant attention—working early and late, taking advantage of the golden moments—for to neglect plain duties now, is fatal to our success or enjoyment afterwards. Conservatories, greenhouses, and all glass structures that are to be used or are in use for plant-growing or decorative purposes, should be cleansed of all debris and frozen or useless stock, so as to give every advantage to plants intended for sale or exhibition. Propagation of the popular kinds of plants, as a rule, should be immediately attended to: that is, if not done already. The potting of most kinds of plants can be done at this season of the year, with better results than at any other time. A precaution here is necessary to those persons having but a few plants, and who are somewhat in the dark as regards plant culture; for with returning sunshine and warm days, these plants (over which many a pleasant hour has been spent) are brought out to the rear of the house, and undergo a general overhauling—particular care being taken to choose the largest pots or tubs on hand to install them in. Here is an error which should by all means be avoided. A moderate quantity of fresh soil to a plant whose roots have filled the pot, is beneficial, but too much is very injurious, if not fatal, except in cases where the plant is very strong and robust, and making rapid growth. As a guide, for instance, if a plant is in a 4-inch pot, move it into a 6-inch pot; using for most plants that are generally found in a small private collection, a rich loam or decayed pasture sod, mixing a little sand with it, which is requisite, because sand is a better retainer of moisture than soil, and holds a supply in reserve in case of neglect in watering—not forgetting to put a few pieces of broken pot over the hole in the bottom of the pot to keep it open, as it is the main outlet for all superfluous moisture. Water is in daily demand by most plants just now, particularly those exposed to the direct rays of the sun or in close connection with fire heat. But in watering, care should be taken not to water any that are in a moist condition.

What with attending to syringing, fumigating, the moving and regulating of plants so as to arrange them in the most beneficial manner, and the many operations too numerous to name, the plant grower has but little leisure time left. However, there is a pleasure and contentment in being employed, and a double amount in plant culture. The flower garden, pleasure grounds, vegetable and fruit gardens, are waiting with impatience to be attended to; duties in these departments are too numerous to name here. Operators should be governed somewhat by location and weather, as well as by surrounding influences. But while there is so much work to be done, let us be thankful for it; and with a delight in what we are doing, let us set about that which most needs doing; which will be self-evident, with a little watching and reading—without which it is nearly impossible to keep in step, in this our time of horticultural advancement.

WINDOW DECORATION.

We have reference to the outside of the window, and think that by paying a little more attention to beautifying our windows with plants, we not only would be receiving a blessing ourselves, but would at the same time be conferring one upon others. For what makes a home look more cheerful in summer time than to see the windows stocked with good blooming plants, when viewed either from the room or the street? But, say some, can plants be grown to advantage on a window sill? All plants can not, but many can. The trial for one season will more than repay you, particularly in the city, where land for flower-beds is not so abundant as in the rural districts. No doubt some of your readers have seen some of the successful window-gardening done in New York city, along Broadway and other notable streets; which, when viewed in early morn in the month of August, look truly grand, and remind us of culture and refinement within. In London, England, the taste for growing plants in windows is remarkable; and in Lancashire, amidst all the smoke imaginable, a great many plants do very well in this manner. Boxes are better for the purpose than pots. The box or boxes should be made the length and width of the window-sill; the height from 4 to 8 inches, according to size of plants desired to cultivate. The bottom of the box should be perforated with holes, so as to admit air to the roots. Over the holes lay a sod or piece of old carpet, which when saturated with water is not liable to dry out so quick, and also arrests the drip when being watered. Then fill the box nearly full of good soil.

In choosing plants, get those that are good bloomers; that is, if you desire them to grow upright. If you desire vines for drooping, a density of foliage is requisite. Roses, fuchsias, heliotropes, geraniums, coleus, cinerarias, lobelia, verbenas, mignonette, vincas, English, Kenilworth, and other ivies, are all good for the purpose. A few ferns and begonias also recommend themselves. As a vine to train round the window, nothing beats the Madeira vine for grace and beauty, with its dense, glaucous foliage shimmering in the sunlight.

Plants, like books, have a language, and speak forcibly in our quiet moments; and in view of their comparative cheapness, everybody can afford the luxury of a few cheerful plants.

PUTTING BARE WALLS TO USE.

In most greenhouses there is some wall or walls that appear conspicuous because of their nakedness. We think that this might be avoided to a great extent by a little outlay and labor, namely, by covering them with the clinging ivies, or other climbers, which are useful as stock plants as well as for their bloom. Another method of covering them is by attaching wire of about 1 or 1½ inch mesh to the wall, by means of iron staples or wooden wedges, the whole projecting out a few inches. Lay moss against the wire from the inside; fill in the vacuum with peat and leaf mould, adding a little charcoal or sand, if on hand. In this, many varieties of fern will grow, which, setting aside their beauty, will be of use to the florist to cut for sale—particularly some of the *Adiantums*. Again, the plants being stationary, have a chance of perpetuating themselves in a natural way, thus insuring a constant supply of young stock. Orchids, foliage begonias, tradescantia, will all do well mixed in with the ferns or alongside, thus adding beauty to desolation.

Of course, this does not apply to walls that are required to be kept dry. But as space is an item in commercial places, it is requisite that we make some profitable use of even a bare wall.

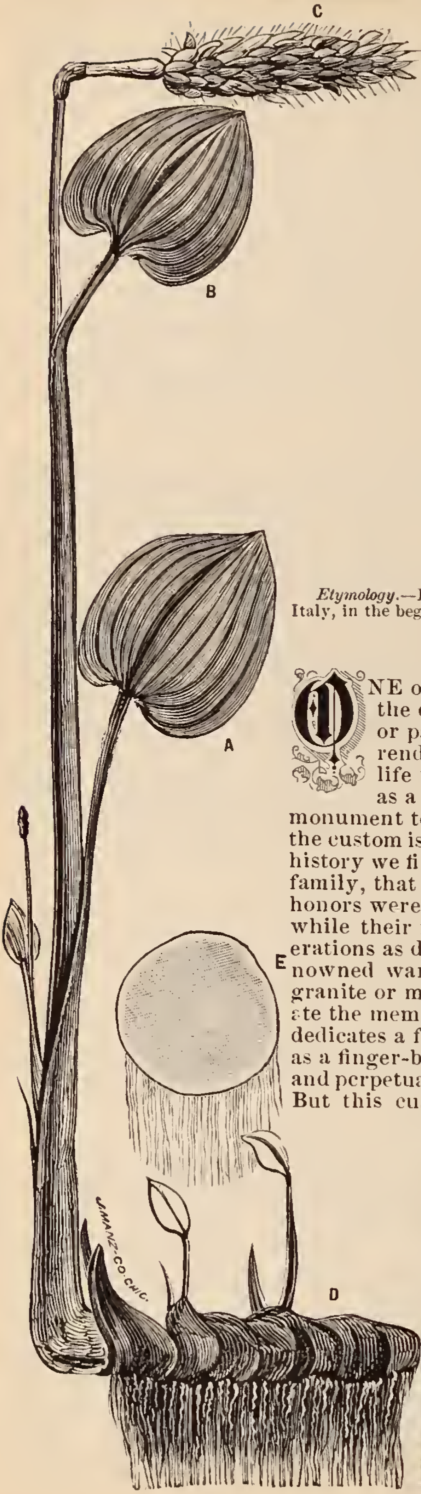


Fig. 92.

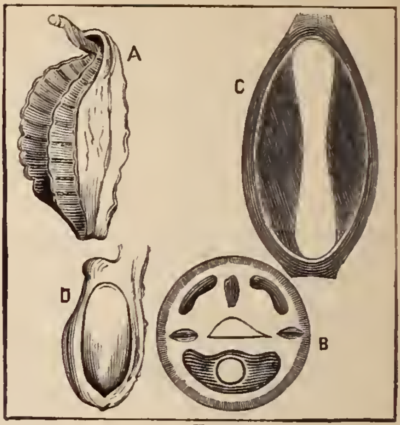


Fig. 93.

PONTEDERIA. Linn.

Order—Pontederiaceæ. A. Richard.
Type—P. Cordata. Linn.

Etymology.—In honor to Julius Pontedera, Professor of Botany at Padua, Italy, in the beginning of the last century.

[Fifth Paper.]

ONE of the most pleasing traits of human nature is the desire to honor the memory of a dear friend or patron with a tribute, in recognition of services rendered; especially, any one that has devoted a life to public service; and this not only serves as a memento of friendship, but also as a lasting monument to their memory for future generations. But the custom is not of recent origin, for if we turn to ancient history we find in the earliest known records of the human family, that to the memory of successful chieftains divine honors were paid and superstitious rites were instituted, while their names were handed down to succeeding generations as demi-gods and heroes. To the memory of renowned warriors and statesmen of recent times, huge granite or marble monuments are raised; but to perpetuate the memory of the man of science, a brother student dedicates a family or genus of plant or animal life to serve as a finger-board, if you please, to point out the virtues and perpetuate the memory of a once successful co-laborer. But this custom is often very severely criticised as an

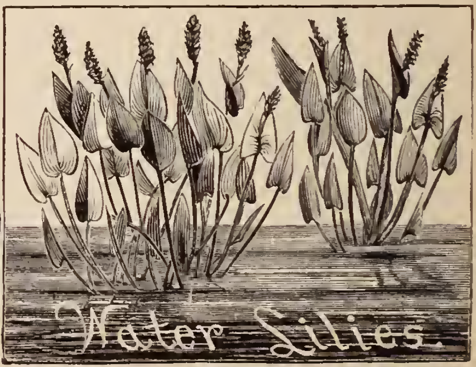

Water Lilies.

Fig. 91.

apparent attempt at hero-worship—a relic of the almost forgotten past, and a custom repulsive to an advanced age of civilization. Happily this idea is not shared in by the many students, and no systematic effort is likely to be made to change the present custom.

It is a well known fact that from our childhood up we become so familiar with the forms we often see, that both the object and its name never seem strange or new to us; but to the great mass of readers the greatest objection often advanced to a scientific or even a well written popular subject treating of newly discovered or strange forms, is the adoption of hard names employed by investigators to designate one object from another, and well informed people will often express surprise that common names are not oftener employed. But when new plants are introduced—from Africa, for example—and the local, native names are also given, they are found to be far less musical and pleasing to our ears than those employed by science. Now, all scientific names are only Greek or Latinized forms of what we often are pleased to call common ones, rendered so to form a common vocabulary for students in all languages, tongues and dialects; for the true man of science knows no national jealousies and strifes, but considers all students as members of one great human family in search of information for the benefit of all mankind. Consequently the same names employed in the English language by science are just as appropriate in the Latin, French, German, etc.; and although they may often seem harsh or obscure, in reality they are the only known adequate means of communication to prevent confusion. But we would like to ask our readers if they ever thought how many of the commonest names we employ for our children,—especially for our daughters, are derived from the different objects of the vegetable kingdom? Probably one-third are thus obtained, and certainly there should be no objection to reversing the custom, and applying similar appropriate ones to a genus of plants.

With the above explanation for a very appropriate custom, we will now say that this genus of plants was first dedicated by Linnæus to Prof. Pontedera, and contains the type (*Pontederia cordata*, Linn.,) of the order, and as a worthy representative of this section of the vegetable kingdom, we have chosen it as a proper subject for our fifth paper on the so-called *Water Lilies*. Perhaps we should also say in this connection that the term Water Lilies is a very indefinite one, and may appear ill-chosen, or meaningless when applied to such forms as the present one, particularly as the word seems to stand synonymous with a plant producing a large cup-shaped or turban-shaped flower. But we have here adopted the term commonly applied to aquatic flowering plants, by people living near them.

The order *Pontederiaceæ* include four genera, viz: *Pontederia*, with five species; *Eichornia*, with three species, possibly five; *Heteranthera*, with three species; and *Schollera*, (*Lepanthus*,) with one species; all of which are peculiar to America, except the single form, *Pontederia vaginalis*, of the East Indies. The genus *Pontederia*, as now constituted, contain only those species that have a fruit with 2 barren cells, and a 1-celled, 1-seeded perfect fruit, in contradistinction to *Eichornia*, which has a 3-celled, 3-seeded fruit. Sir Joseph Paxton, however, considers both the *Pontederia* and *Eichornia* as constituting only one genus, and ranges all the species under the genus *Pontederia*. We will not dwell longer upon this point, but leave every one interested in the subject to study and form their own conclusions.

To complete a popular article of the present character, a scientific description must also be added, to gain a full knowledge of the subject under consideration; and as the descriptions are a part of the fundamental principles of all our popular as well as scientific botanies, it will as a matter of necessity be only a reprint in part from them. From the latest editions of botanical works, we find a scientific description to read:

GENUS PONTEDERIA. LINN.

Stout, perennial aquatic or marsh herbs, growing in shallow, still or slow running water, with a short, thick, creeping rhizome (root-stock), and producing erect, long petioled, radicle leaves, largely sheathing at the base, and a 1-leaved stem or scape, terminated by an ebracteated, hairy spike or panicle of blue, ephemeral, usually sessile flowers, from a 1-leaved green spathe. The leaf-blade is mostly heart or arrow-shaped, with prominent arched nerves and parallel veins. The flowers are 2-lipped, the upper 3 segments uniting to form the upper lip of 3 lobes, and the 3 lower ones more spreading and with more or less separate or lightly cohering claws forming the lower lip. The flowers open only for a day, and with the morning sun, but like most of the so-called Water Lilies, closing at the approach of evening by rolling up from the apex downward as it closes; the 6-ribbed base thickening, turning green, and enclosing the fruit. Perinth of 6 divisions, irregularly united below in a corolla-like tube. Stamens 6, unequally inserted on the tube or throat of the perinth, opposite the 6 perinth segments; the 3 upper ones shorter, low down in the throat, and often sessile; the 3 lower ones with incurved filaments, and inserted near the summit of the tube. Fruit, a 3-celled, 3-valved capsule, opening longitudinally, and enveloped by the fleshy perinth; 2 of the cells of the ovary barren, and a 1-celled atriculated fruit, with a single suspended oval seed.

The following list of species, from Sir Joseph Paxton's "Botanical Dictionary," are now included in this genera, with their habitat, etc., according to latest authorities. (Sir Joseph Paxton's list includes all the species now known as *Eichornia.*)

SPECIES.		Color of Flower	Habitat.	Height.	
Cerulea.	Perennial.	Blue.	North America.	1½ ft.	1830
Cordata. Linn.	Perennial.	Blue.	North America.	2 ft.	1759
Cordata, var. Angustifolia. Pursh.	Perennial.	Blue.	North America.	2 ft.	1816
Cordata, var. Lancifolia. Mulh.	Perennial.	Blue.	North America.	2 ft.	1815
Vaginalis.	Evergr'n.	Blue.	Japan & E. Ind.		

By reference to the above table, it will be seen that the *Pontederia* were unknown in the old world until introduced from America, and are represented by only one species in Australasia; while the four American forms have a long geographical range, extending, according to Sir Joseph Hooker, (Descriptive and Analytical Botany,) from 40° North latitude to 30° South latitude. Recent explorations and surveys of the country, together with observations of botanists and travelers, have established the fact that it is indigenous much further North than Sir Joseph Hooker supposed. A brief and incomplete summary of our efforts to find its northern limit by correspondence may be of interest to some of our readers, and we will give it here. In the list of plants as given in Thompson's Natural History of Vermont, we find it enumerated, but as no locality is given, the information is too indefinite to be of much practical value, as the State extends from about 42° 45′ to 45° North latitude, or about 135 geographical miles. It is, however, definitely located by C. G. Pringle as along the whole northern border of Vermont, lat. 45°, and extending to the St. Lawrence river, lat. 47°, in the same longitude of Vermont; also, at Ann Arbor, Mich., lat. 42°—(Winchell); at Lansing, Mich., lat. 42° 45—(W. J. Beall); at the mouth of Bad River, on Lake Superior, Minn., lat. 46° 30—(Dr. C. C. Parry); and on the James River, Dakota, lat. 47°—(Mrs. E. S. Tupper.) This we had concluded to be about its northern limit, as in the very complete and carefully prepared list of plants published in the Canadian Report of the United States and British North American Boundary Commission (1875) it is not enumerated. But judge of our surprise to learn only a few days ago, in a private letter from C. F. Wheeler, of Michigan, that it is recorded as found in the valley of the Saskatchawan River, British North America, about latitude 53° North.

As *Pontederia cordata* is our commonest native species, we will more especially consider it now. A scientific description reads:

PONTEDERIA CORDATA—*L.* (*Wampee or Pickerel Weed.*)

Leaves, arrow-heart shaped, blunt, with rounded lobes, finely nerved, from 3 to 8 inches long; flowers, dense, in a cylindrical spike about 2 inches long, the peduncle enclosed in a convolute spathe-like bract; upper lobe of the hardy perinth marked with a pair of small yellow spots; in bloom from July to September, or until frost; calyx tube in fruit crested with 6-toothed ridges; habitat, in water usually from one to two feet deep, from the Atlantic Ocean to the Rocky Mountains, and from Maine to the southern coast of Florida and to Vera Cruz.

This is the most northern species of all, the geographical center of which may be considered as Northern Indiana, where it forms immense beds in the soft, peaty swamps and marshes, usually in only a few inches of water, but often in only damp or moist ground. Sometimes, however, it is found growing in water nearly three feet deep, throwing up from 3 to 10 leaf-stocks, every one of which is terminated by a single raceme of flowers. In our aquarium, where we could study them best, we noticed that after the flowers had matured, all the portion of the flower-stem down to the first joint bends over to a horizontal position, as represented in Fig. 92, *c*, in which position it remains until the seed are ripe, after which the stem withers and decays. Our illustrations (pages 22 and 25) give a better idea of the plant and its anatomy than words can do, so we will notice them in detail. Fig. 91 represents two plants, as they are often seen in their normal condition. Fig. 92 represents a single plant, (many times smaller than the actual plant,) as usually seen when taken from the water and earth, with the radicle (root) leaf at *A*, the spathe at *B*, the ripening panicle of seed at *C*, the creeping rhizome at *D*, showing the manner of growth, as also the young leaves breaking out and springing up to form new crowns or branches of the rhizome; while at *E* is given a cross section of a rhizome nearly the usual full size, showing its fine porous structure. Underneath the rhizome *D*, and also the section *E*, is seen the small fibrous roots growing almost in a mass or mat. Fig. 94 represents at *A* the spathe and panicle of flowers, at *B* a panicle of flowers nearly

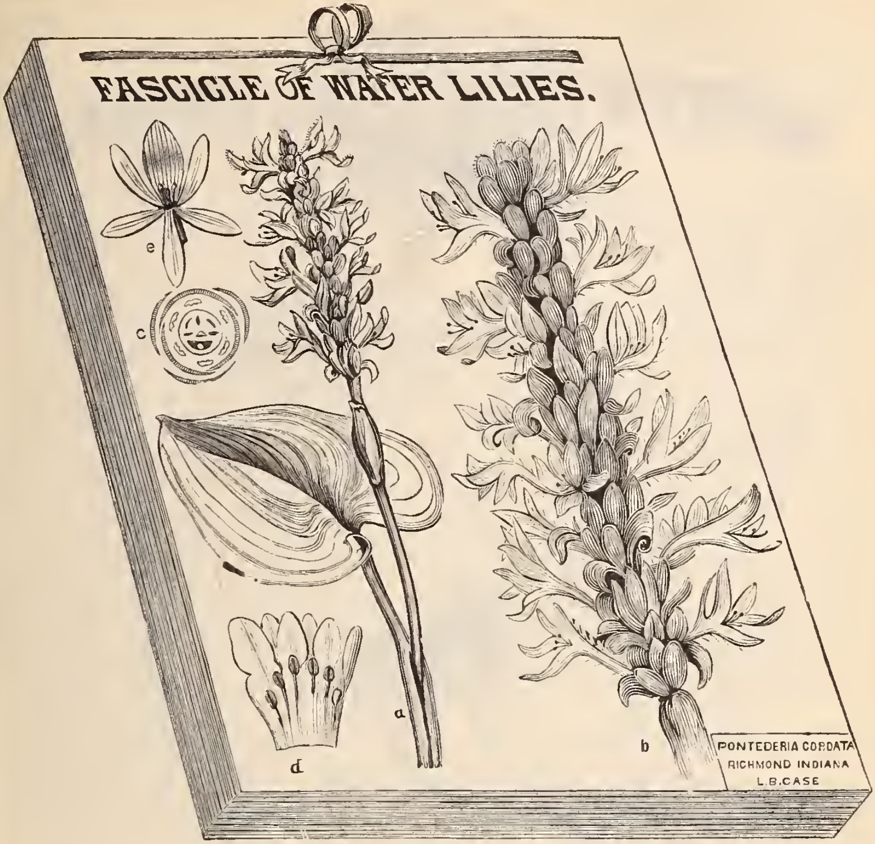


Fig. 94.

natural size, at *E* a front view of a single flower, at *C* a cross-section or diagram of a flower, showing the relative position of the component parts, and at *D* the perinth (flower) laid open to exhibit the general form before expanding, also to give the form and position of the stamens. Fig. 93 represents at *A* a single fruit from the panicle, covered with the dried and adhering perinth (flower); at *B* a transverse section of a fruit, showing the position of the single perfect ovule, (seed), and the two abortive seed, with the three partition walls dividing the fruit into 3-cells; at *C* a vertical section of the fruit, and at *D* an ovule (seed) in position.

Although this is one of our hardiest native plants, it is also one of the first to feel the effect of frost, for we often find their foliage killed by our light, early frosts in autumn, while other aquatic plants do not seem to be injured from it in the least.

P. cordata, variety *Angustifolia*, has triangular-elongated and tapering leaves, scarcely heart-shaped at the base. (*Gray.*)

P. cordata, variety *Lancifolia*, Mulh., (not *Lanceolata*, Sir J. P.,) leaves lance-oblong to lance-linear; habitat, Southern States, (U. S. N. A.); in bloom during April and May. (*Gray.*)

P. vaginalis is esteemed as a medical plant in Japan, Java, and on the Caromandel coast, where a decoction of its root is used in diseases of the liver and stomach; pulverized and mixed with sugar, it is administered for asthma; it is chewed for the toothache; its leaves, bruised and mixed with milk, are administered in cholera, and its young shoots are edible. (*J. D. Hooker, in Des. and Ana. Bot.*)

In conclusion we would say, these plants are certainly among our prettiest aquatic flowering plants, but from their great abundance are often considered inferior to many more expensive but less effective ones, for which reason they are almost entirely ignored in American floriculture; but in Europe, where they are brought into requsition by practical landscape gardeners, they are fully appreciated and extensively employed.

NATIVE FRUITS,

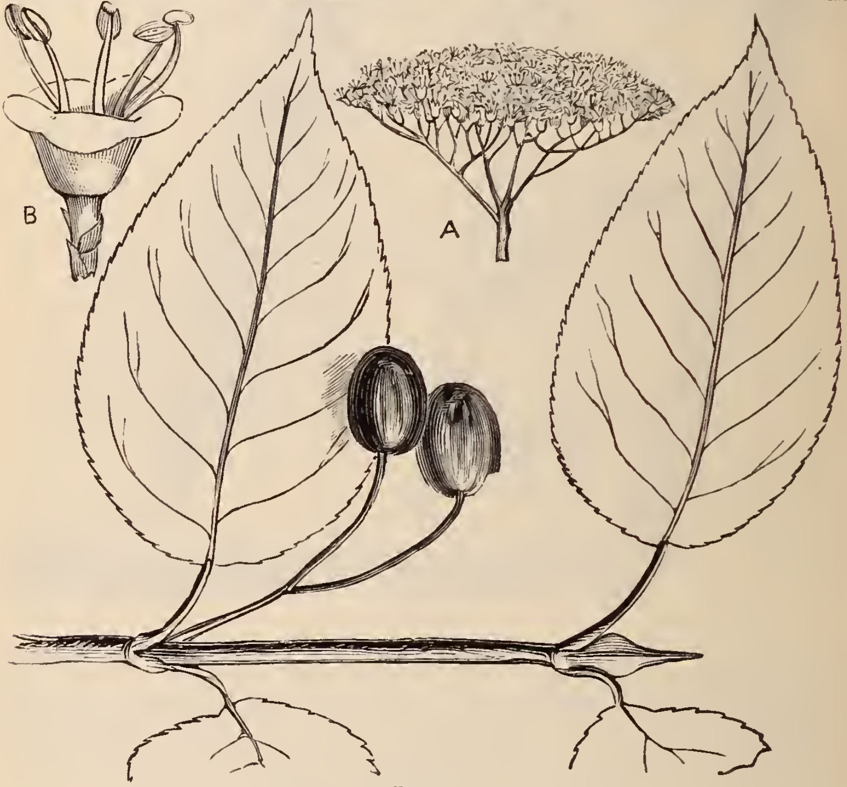


FIG. 95.

VIBURNUM PRUNIFOLIUM. LINN.

FOR this number of the INDEX, we have selected one of our commonest native fruits to talk about—the Black Haw of common parlance; and although we do not remember to have ever seen it under cultivation, it is certainly worth a trial and some attention, as it is one of the little gems of fruit much sought after in autumn when its shining bluish-black fruit is ripe. But before we proceed further with the subject, let us take a passing view of the genus of plants to which our fruit belongs. Here we have a genus containing about fifty species, nearly all of which are natives of the temperate zone, and contain many of our choicest flowering shrubs, such as the snow-ball and cranberry tree of our lawns, and the so-called *Laurestinus* and *Viburnum odoratissima* of our conservatories. But none of the fruit-bearing varieties of *Viburnums* are of any economic value for fruit except the Black Haw, at least in a fruit country like ours; yet in Norway and Sweden, where choice fruit is scarce, the small red berries of the snow-ball are eaten as fresh fruit, and also prepared with honey and flour as a means of subsistence. Some of the other fruiting species are *V. lentago*, (the sheep-berry)—which, however, is so closely allied to *V. prunifolium* that a strong doubt is always expressed of their being more than one species,—*V. nudum*, together with several indefinitely marked forms or varieties which have edible but almost tasteless fruit; also, *V. molle*, the Poison Haw of the Southern States, with a blue berry. In regard to *V. lentago*, Dr.

Engelmann says he was "unable to distinguish the stones of *V. prunifolium* and *V. lentago*, and almost felt inclined to unite both, as in his neighborhood (St. Louis) at least the former was a most variable plant, with broad or narrow, obtuse, acute or acuminate, glabrous or rusty leaves, and larger or smaller flowers, growing in rocky woods or in deep bottoms, and with many approaches to the Eastern *V. lentago*, which in its typical form is not found near there."—*Trans. St. Louis Acad. Sciences.*

By a reference to standard botanies, we find a generic description to read:

GENUS VIBURNUM. LINN.

"Shrubs with simple, opposite leaves, and numerous small white flowers in a flat, compound, terminal cyme. Each flower has a minute, 5-toothed calyx; a rotate or bell-shaped corolla, which is 5-lobed at the edge; 5-stamens: 1—3 nearly sessile stigmas; and an ovary possessing in the young state 2 or 3 cells, but becoming 1-celled and 1-seeded as it ripens into the berry."

The origin of the name *Viburnum* is very uncertain, but usually considered as being derived from the Latin verb *vieo*, to tie. "The ancients made use of the word *viburna* to signify any pliant, branched plant, that could be used for tieing or bending."—(*Treas. of Botany.*)

A few years ago we transplanted a fine, thrifty young specimen of the Black Haw from a swampy or peaty thicket to a dry corner of our garden, where it has even more than fulfilled our expectations as an ornamental shrub, as well as bearing a desirable fruit. In all our botanies its habitat is given as "woods or dry copses," (sparsely wooded fields,) but the finest specimens of the fruit we ever saw were those found in swampy thickets and hedges, or near streams of running water; however, it is quite doubtful whether the locality of the shrub makes any material difference with the fruit—probably we accidentally found finer examples of fruit in these places. But be that as it may, it illustrates its capability of adapting itself to a dry or moist situation as occasion may require, which is of the utmost importance in cultivation. There can be no reasonable doubt of its susceptibility of improvement under cultivation, as well as in the hands of professional hybridizers or skillful nurserymen, and we hope to see the experiment made and to learn of the results. Probably the fruit is unknown to most of our readers, especially by name, so we will add a description of both fruit and tree, as given by Profs. Gray and Wood, adding a few notes of our own observation.

Viburnum Prunifolium, *Linn.* "A small tree or tall shrub, growing from 10 to 20 feet high, with smooth, slender stem and branches; large, obtuse or slightly pointed, finely and sharply serrated, bright green leaves, (2 or 3 inches long,) changing to a rich glossy, bronzy crimson with frost in fall, and remaining attached to the branches until late in fall or early winter. Whole plant glabrous, or covered with some minute rusty scurf. *Flowers* terminal, white, in a flat compound cyme about 4 inches in diameter, but each separate flower small, almost minute, all alike and perfect, sterile, and produced in May or June. *Fruit*, a 1-celled, 1-seeded, black oval drupe, nearly ½ inch long, ripening in October with a bluish bloom, giving the fruit a metallic hue; flesh a soft, sweet, edible pulp, with a thin, very flat and even, crustaceous, broadly oval or orbicular stony nut or seed."

At the head of this article we give a representation (Fig. 95) of an end of a branch cut in November, showing the exact form and size of the leaves, with the terminal bud enclosed and protected by two hard, horny scales. The small, perfect flowers are already formed in the bud, and only await the warm, genial spring sun to develop and burst the scales. The flowers are represented at Fig. 95, *a*, about one-half natural size, while at *b* is a single flower enlarged to show its true character. The fruit is represented at Fig. 95, *c*, a little less than the natural size of the fruit from our garden, which, however, is some larger than that usually grown on the ordinary wild trees, and the fruit is produced quite freely, even on quite young shrubs.

But it must be borne in mind that nearly all our choice varieties of table fruit bear very little resemblance to the original or typical species from which they originated, and the change has been usually produced by carefully selecting the finest examples of wild fruit, to improve either by cultivation or hybridizing, and again to select only from the most perfect cultivated fruit for still further improving. This is a subject the importance of which cannot well be over estimated, and we particularly wish to impress upon our fruit-growing friends the fact that they have within their reach the foundation of a fruit new to economic and commercial values, but which we think is destined at some future day to form a very important addition to our desirable fruits.

Another very important consideration in connection with this fruit is its extreme hardiness, differing in this respect from most of our cultivated fruits by not being so liable to suffer from our occasional severe winters. Add to this their quality as producing a desirable fruit the fact that they are a very desirable ornamental lawn shrub, both in spring when in flower, and in fall when they are clothed with their bronzy foliage.

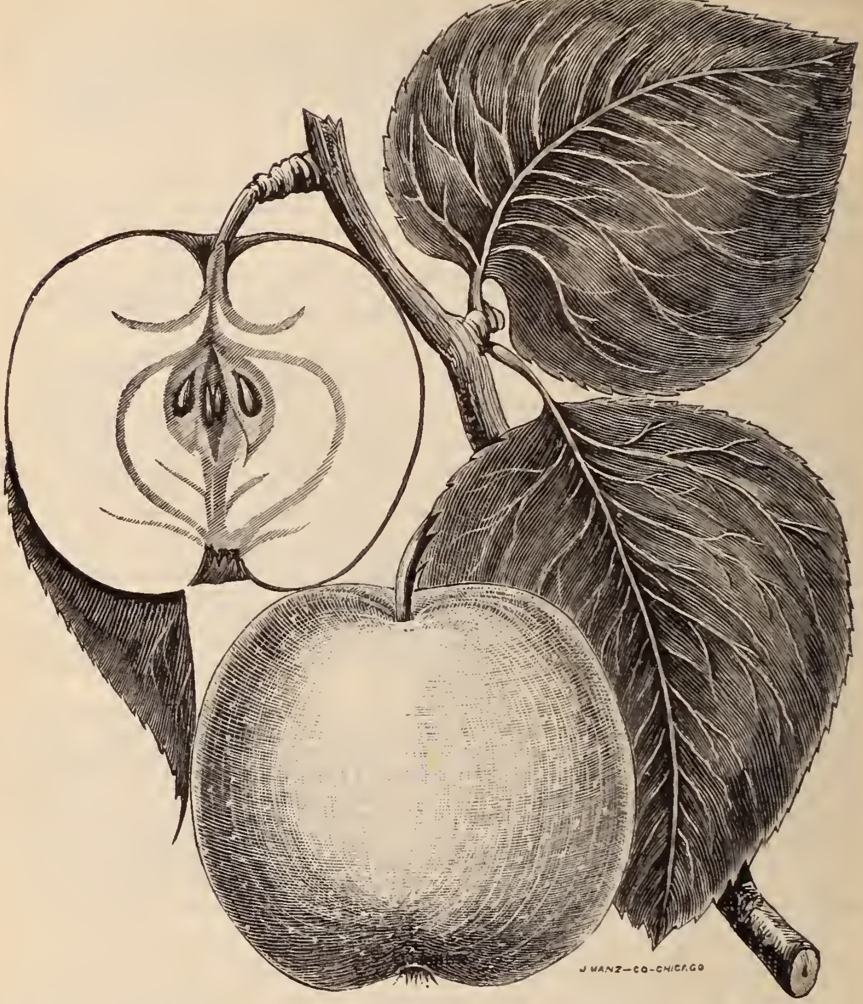


FIG. 96.

SOME NEW OR LITTLE KNOWN PEARS.

BY E. Y. TEAS, DUNREITH, IND.

THE Quince has been highly esteemed for more than two thousand years, both as an ornamental tree, and for the surpassing excellence of the fruit. Columella says, "Quinces not only yield pleasure, but health;" and Pliny gives directions for preserving quinces by plunging them into boiling honey, a practice in use with this and other fruits in Italy at the present day. But quinces have never been abundant in the central and northern portions of the United States, because the plants are often injured by our cold winters, and are also liable to destruction from the attacks of borers in the trunk of the tree, and by twig blight; so that an abundant supply of this delightful fruit is not likely to be had.

I have long believed that a satisfactory substitute for quinces may be found in some varieties of the Pear, which though not of the best quality as dessert fruits, are nevertheless unsurpassed for canning and preserving; varieties uniting these desirable qualities with great productiveness, and almost absolute hardiness and health of tree. In pursuance of this subject, my attention has been called from time to time to a race or races of pears not at all new, but which have not received the attention from cultivators that their importance demands; because I am convinced we may reasonably expect to obtain seedlings from these, rivaling the Bartlett and Anjou in quality, and at the same time exempt from blight or other disease. I refer to the Chinese and Japanese Pears, of which several varieties are now in cultivation; a few of these I will name.

"SHA-LEA," OR "CHINESE SAND PEAR." [*Fig. 98, No. 2.*]

This pear has been cultivated by Mr. Garber, of Pennsylvania, and others, for thirty years or more. Mr. G. has fruited it abundantly, producing, as he writes me, cart loads of splendid fruit, as large and golden as large oranges, without ever an appearance of disease, defect, or mark of insect enemy on tree or fruit; qualities alone that entitle this tree to a place among our choicest ornamentals, and justify the

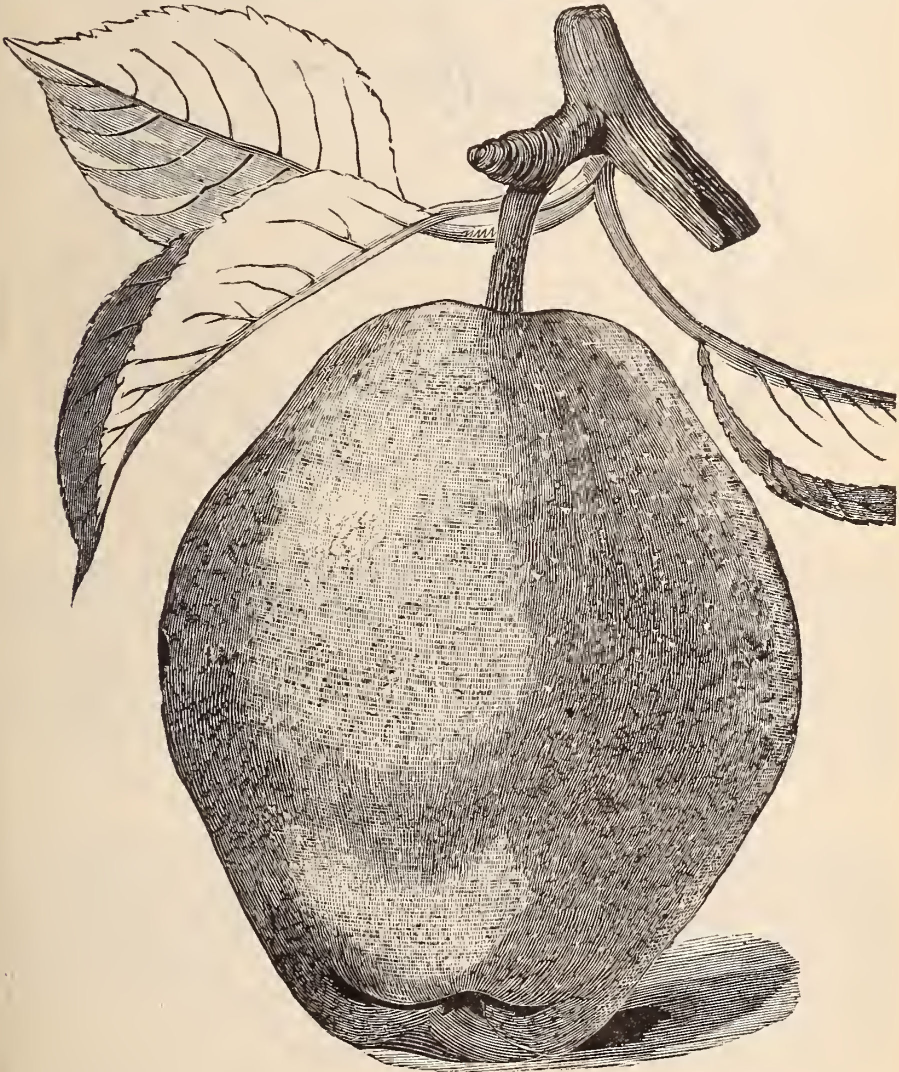


Fig. 97.

[We are indebted to William Parry, of the Pomona Nurseries, Cinnaminson, N. J., for the above cut, which is a true representation of the new *Kieffer's Hybrid Pear*. We might also add, Mr. Parry has an orchard of 350 trees of this variety only, and places great faith on their market value. For further information on this very interesting subject, we would refer our readers to Mr. Parry's circulars, which would be forwarded to all enquirers, on application; also, to the very interesting article on the "Kieffer Hybrid," in the *American Agriculturist*, for January, 1879.—L. B. Case.]

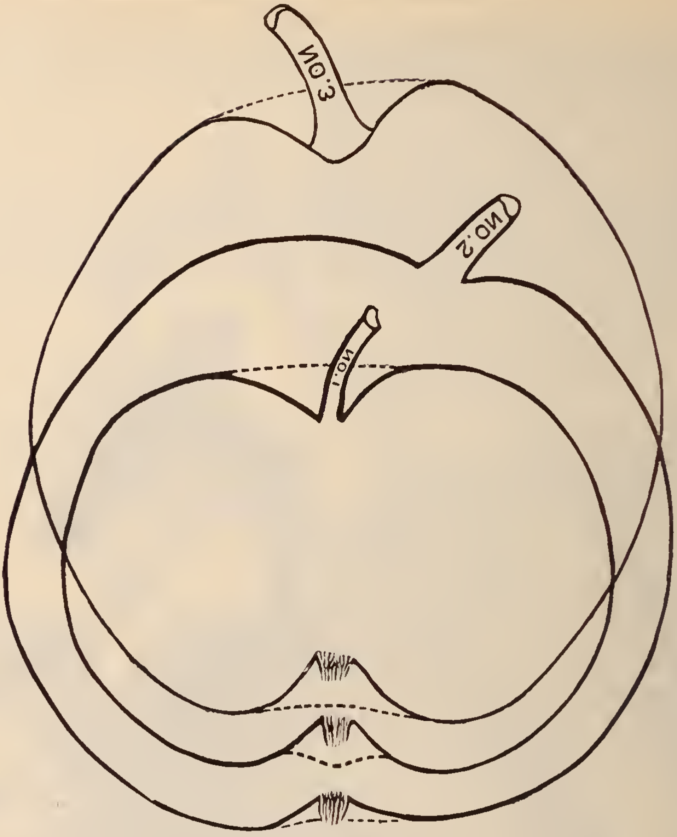


FIG. 98.

conjecture that this was the true "Golden Apple of the Hesperides." The trees, when laden with their ripe fruit, equal in beauty the orange tree in its tropical home. The fruit abounds in a pleasant aromatic juice, mingled with a coarse flesh something like a pineapple in taste and texture; its firmness causes it to keep well, a month or more after maturing in September. As the fruit never becomes mellow, it was deemed worthless until within a few years its value for culinary purposes has become known, and wherever grown, the fruit is in greater demand than any other pear of the season. When cooked, the flesh becomes more fine and tender than a quince, possessing also a quince like flavor. The foliage is very large and distinct; leaves often 4 or 6 inches long, of a thick, leathery texture, downy underneath.

GARBER'S HYBRID.

So far as seedlings of the "*Sha-lea*" have fruited, while the appearance and habit of the trees are almost identical with the parent, the fruit varies considerably, some being small and inferior—some pear and some apple shaped. Mr. Garber has raised one seedling, out of a small number fruited, that is a decided improvement on the "*Sha-lea.*" This is an excellent dessert pear, superior to some of the highly praised foreign sorts, and still possesses the habit of growth and characteristic hardiness and vigor of the parent. It is believed to be a hybrid between the Chinese and one of our cultivated pears. It is of large size, and ripens in August. This is called "Garber's Hybrid," and is very similar to No. 2 (Fig. 98) in outline.

"KIEFFER'S HYBRID," [Fig. 97,]

Is the result of the bloom of "*Sha-lea*" being fertilized with pollen from Bartlett, thus uniting the vigorous growth, great productiveness, and freedom from blight of the former, with the luscious quality of the Bartlett. Fruit very large, 10 to 12 inches in circumference, and often weighing three-fourths of a pound. The shape is much like an elongated Orange Quince, being different from almost any other fruit. The color is a beautiful yellow, shaded blush, season October.

THE "SANDWICH ISLAND PEAR." [*Fig. 96, and 98 No. 1.*]

About twenty years ago, a lady from near Cincinnati, Ohio, visiting in San Francisco, bought at a fruit stand in that city a "Sandwich Island Apple." This fruit was so very fine that the seeds were saved and sent to friends in Ohio. Only one seed grew, and it produced what has been called the "Sandwich Island Pear," a fruit resembling both the apple and pear, but distinct from either. The foliage and habit of growth is almost identical with the "Sha-lea," differing in having broader and deeply serrated foliage, and light green bark. The fruit is generally near the shape of a Rambo apple, though larger; occasionally quite oblong flattened; in color a beautiful yellow, with often a fine blush on the sunny side. This fruit ripens in September, and is unsurpassed for canning and preserving.

THE "CINCINCIS" PEAR, [*Fig. 98, No. 3,*]

Is one introduced by Mr. Smith, of Ohio, but believed to have been brought originally from the south of France. This tree has fruited for over fifteen years, producing quite large, more quince than pear shaped specimens, of a beautiful orange color, ripening in September, and keeping in good condition a month or more after coming from the tree. For canning or preserving, this fruit is considered superior to any other of its season. The growth of the tree is very vigorous, foliage of enormous size. The seedlings often attain 4 to 6 feet high the first year, and grow with proportionate vigor until checked by early and abundant fruitfulness. From their healthy growth and entire exemption from blight, the seedlings are believed to be of value as stocks to work other varieties of the pear upon. The "Cincincis" is probably a regular Japanese pear, or a seedling from it.

Here we have three apparently different varieties or species of the pear, with many points of resemblance in the appearance and quality of the fruit, and almost identical in growth; all possessing remarkable vigor, uniform health, handsome fruit, of great value for economic purposes; and as ornamental trees for the lawn or garden, scarcely equalled by any in cultivation. These all put out early in spring, and retain their large, deep green foliage until frost. They all come into bearing young, and are very productive.

Some of the French nurserymen are offering trees of two sorts of Japanese pears. One, called "Mikado," is described as "having very large, serrated leaves; fruit medium, round, very flat, brown russety color; stalk long; flesh half fine, half melting; ripens in September. This sort imported from Japan, will be probably the beginning of a new race of pears." The other, "Von Siebold," is "a new Japanese sort. The tree is of a peculiar and very distinct appearance."

I do not know whether these are identical with either of the varieties of oriental pears described above, or not. The description of the "Mikado" corresponds very nearly with that of the "Sandwich Island," and it is likely the latter came from Japan to the Sandwich Islands. But these pears are the foundation for hopes of great things in producing new and hardier varieties of pears, either from artificial hybridization or from seedling varieties; and this is an open field for experiment, for any one willing to enter it.

The study of the Geographical boundaries of plants is one of the most interesting and instructive subjects, not only for the botanist, but for all intelligent people; yet, we never seem to fully comprehend the fact that only a very limited number of our best scholars are familiar with the natural geographical limits of many of our commonest plants. Now this is a very important consideration and is much to be regretted. But we know of no better method of correcting it, than by the publication of carefully prepared, and complete lists of plants, from all parts of the country. To be sure, many of the Reports of the Government Surveys of the public domain contain partial lists of the particular portion of the country passed over, and many of our magazines, journals and papers occasionally publish lists from travelers and students, usually, however, only the new or strange forms noticed or found by them, while a goodly number of our more liberal collectors each year publish at their own expense catalogues or lists of plants, usually from the older settled portions of the country. Of course we could not publish in our limited space every thing we would be glad to, or that may be sent us, but some lists would be very acceptable. First, we solicit complete local lists of Native ferns, specially from the northern fern area, and as everybody is very much interested in good fruit, we should be pleased to receive full local lists of native American fruits, including all those usually considered of no commercial or economic value. We also request complete local lists of native aquatic plants, including grasses and weeds as well as flowering plants, and especially the so called Water Lilies. We will, therefore, designate our subjects by the name of Native Fruits, Native Water Lilies, and Native Ferns. If your list does not appear immediately upon reception, do not be disappointed, for we have quite a quantity of manuscript already for future numbers, and of course must select from the most desirable or appropriate for the coming numbers.

B. CASE
RICHMOND
IND.
CASE
IND. RICHMOND
FROM
J.V. & S.
LONDON

NEW & RARE PLANTS

[We would request any one having new or strange Plants, to send us a notice for publication in these columns.]

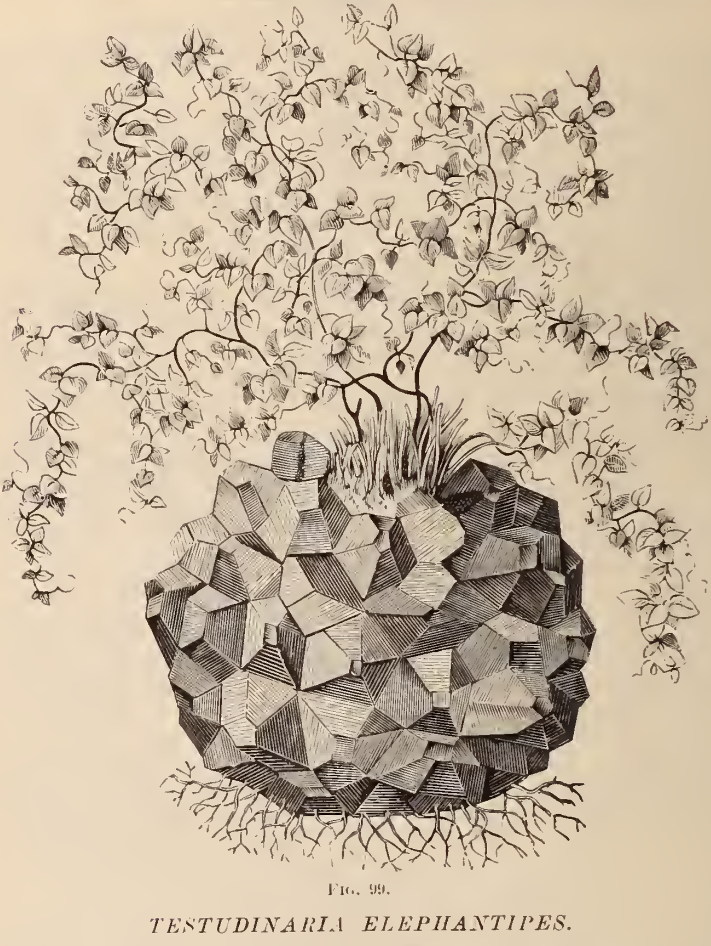


FIG. 99.

TESTUDINARIA ELEPHANTIPES.

THERE is probably no place of equal extent on the earth that has produced as many strange forms in vegetable productions as the Cape of Good Hope. And as many of these forms are very seldom seen in cultivation, (for indeed the attempt has never yet been made to cultivate some of them,) the little knowledge we have of them must be gathered from scientific books or books of travel. The above illustration (Fig. 99) faithfully represents one of these curious plants—the *Testudinaria Elephantipes*—which is sparsely met with in choice collections of plants, both in Europe and America; but for its description, economic value and history, we will quote from the "Treasury of Botany," and "Paxton's Botanical Dictionary." Scientific botanists place this genus of plants in the *Order Dioscoreaceæ*, which contain the Chinese Yam, Dioscorea, Rajania, and Tamus, all of which are characterized by fleshy roots (tubers or rhizomes) and herbaceous stems, twining to the left. The various species produce edible, farinaceous tubers, but Tamus exhibit a dangerous acridity, (poison.) Dioscorea furnish a very important article of nutritive food, under the very common name of Sweet Potato and Yam.

But let us now see what we can find in standard works of botany. In the article on *Testudinaria*, we find: "The distinction between this genus and Dioscorea, the type of the order of Yams, (*Dioscoraceæ*,) depends more upon the general habit of the plants than upon characters derived from the flowers or fruit; for with the exception of the seeds being winged at the top only, instead of all round, their technical peculiarities are almost identical. In habit, however, they differ widely. True Yams produce large underground, thin-skinned tubers; but in the three species of the *Testudinaria*, the corresponding portion called the root-stock, or rhizome, is wholly above ground, which is coated with a thick, bark-like, corky or woody substance, which in time becomes deeply cracked and forms large angular protuberances, as if carved by the hand of an eminent sculptor, which have a fancied resemblance to the shell of the tortoise, whence the name. These rhizome are more or less globular, and frequently of a large size—some of them measuring 4 feet in diameter. Several slender, climbing stems rise from their summit and grow to the length of 30 or 40 feet, bearing small, entire, smooth, more or less heart-shaped leaves, in the axils of which the short racemes of little, inconspicuous, greenish-yellow flowers are produced. At the Cape of Good Hope it is known as "Hottentot Bread," the fleshy inside of the rhizome having at one time afforded part of the food of Hottentots, though now it is only eaten by baboons and other animals." (*Treas. of Botany.*)

There are only three species of the *Testudinaria* known to botanists, two of which are from the Cape of Good Hope and one from Mexico. The propagator has not found any way to increase it except from seed, which are difficult to obtain, as the plant is diœcious, and both sexes have not yet been grown near together, either in Europe or America. They succeed well in peaty or turfy loam. They should be kept dry when not growing. (*Paxton's Botanical Dictionary.*)

We have only a single specimen plant of it, and do not wish to be understood as advertising it, but would undertake to procure it if desired. Of the allied form, *Dioscorea bulbifera*, the Chinese Yam, we have quite a stock, and can furnish them at a very reasonable price. The bulbs of *Testudinaria Elephantipes* are worth from 10 to 200 francs each, or about from $2 to $40 each, in Belgium, according to the size; but to bring them here will about double the cost.

NEW COLEUS FOR 1879.

Kentish Fire, leaf trilobate, deeply serrated, center of leaf bright vermilion and crimson, changing to carmine, edged and suffused with a dark metallic green. This superb variety was introduced by the distinguished English florist, H. Cannell, and has created quite a stir in horticultural circles in Europe. It is without doubt the grandest acquisition to new Coleus that has as yet been introduced. $1.

George Bunyard, is a very fine variety, habit robust, leaves of good size, its midrib, veins and connecting veinlets are of a deep carmine color. The upper surface of the leaf is of a bronzy crimson, edged with yellow and green. 50 cents.

Lord Falmouth, one of the best of our recent importation. The coloring of the foliage is rich and varied, shades and marking of crimson, yellow, orange and green, being seen in the same plant. 50 cents.

Empress of India—Bright crimson maroon, narrow yellow edge. 50 cents.

Exquisite—Brilliant violet-carmine leaves, with a broad lobed green margin. 75c.

Fascination—Brilliant crimson center, surrounded with yellow, deeply laciniated green edge. 50 cents.

Garnet—Veined and blotched violet, crimson center, surrounded with chocolate, green edge, lobed. 50 cents.

Mr. J. Linden—Bronzy crimson, with a broad and bright yellow edge. 50 cents.

Royalty—Center blotched and veined with violet-carmine, surrounded with chocolate, green edge, lobed; broad foliage. 50 cents.

CHOICE COLEUS, OF GREAT MERIT.

Albion—Yellow ground, spotted and edged with crimson. 25 cents.

Compte de Greffuhle—Golden color, striped with vivid purplish-crimson. 25 cents.

Eldorado—Golden yellow, with a narrow crimson edge and mid-rib usually. 25c.

Madame E. Burgess—Green ground, with deep amaranth veins. 25 cents.

Multicolor—Crimson, red, rose, and often yellow; deeply laciniated. 25 cents.

Musaica—Marbled and spotted with yellow and crimson. 25 cents.

Oriole—Deep yellow border, crimson center, with irregular bronzy-purple blotches. Our seedling of 1874. 25 cents.

Pictus—Green ground, marbled with bronzy-yellow, maroon and crimson. 25c.

Splendens—A clear, bright wine-color; an improvement, but variety of *Varschaffelti.* 25 cents.

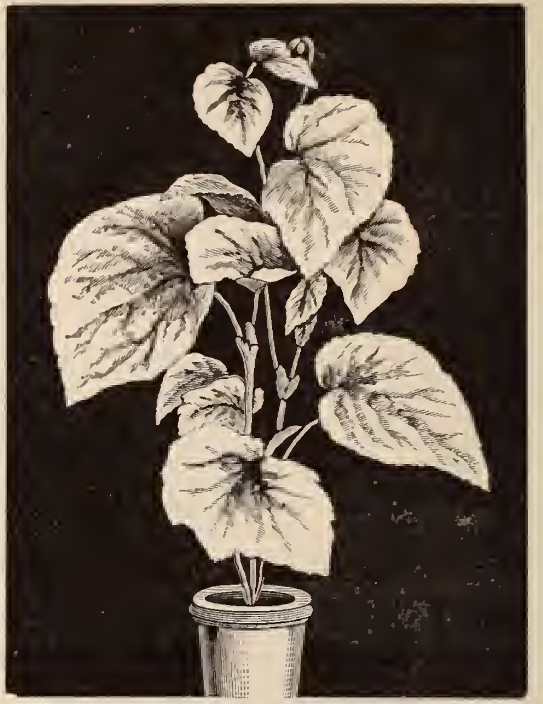


FIG. 100.

BEGONIA DISCOLOR-REX.

A NEW RACE OF BEGONIAS.

BY M. BRUANT, POITIERS, (VIENNE,) FRANCE.

We apply the above denomination to the new Begonia, which brings to mind the two parents from which they were raised—the *Begonia discolor* (the mother) being fertilized with *Begonia Rex,* or its varieties, as father—and an extremely remarkable generation has issued from them. In fact, the children have the vegetation, the blossom, the branching and elegant form of *B. discolor*, with the beautiful mixed color foliage of the *Rex* varieties of the hot-house. Besides, they have all the rusticity of the mother, (*B. discolor*,) which is to say, that the bulbs did stand, this winter, 10° centigrade of cold without suffering; and the father has conveyed to them the faculty of preserving their foliage during winter when they are placed in the hot-house. They are indeed privileged children, which have inherited from their parents essential qualities without any defect. Besides, their rusticity in the common ground is demonstrated. Those which have been left outside for experiment, withstood, without suffering, all the temperature and the intense frost of this winter.

Their culture is of the easiest. They can be kept in the common ground, or stored after the falling of the leaves, like the bulbous Begonia; or they may be placed in the hot-house before the falling of the leaves and be kept in continuous vegetation. Their solid constitution enables them to submit to any kind of culture.

I send you a rough sketch, representing the general form of the plants. In the variety which has been used in making this drawing, the upper face of the leaf is a silver white, rose washed, with green designs accompanying the edgings; the under face is of a light red; the petioles and the stems of a dark red; a floral stem appears at the top.

I have offered to the trade eight new hybrids of Begonia; others will be delivered at some future time, under the title of *Begonia Discolor-Rex.* These plants have made a sensation in the horticultural world; they are bound to become a great success for trimming decorations for the garden, as we can keep in common ground Begonias with mixed color foliage, with the pretty blossom of the *Begonia Discolor*, and the rusticity of this latter.

I hope that these explanations, which you desired to have, will interest you; and in case you should make any use of them in your Botanical Index, you will confer a favor on me by addressing to me such numbers as will contain them.

VARIETIES OF BEGONIA DISCOLOR-REX.

[Sent out for sale the first time in October, 1878. First Prize awarded at the great International Flower Exhibition at Versailles, August, 1878. First Prize awarded at the Autumn Flower Exhibition of Bordeaux, September, 1877.]

The following varieties are placed on sale, with the accompanying description:

1.—Mme. Svahn.

Very large and magnificent foliage, fully able to compete with the most beautiful varieties of the hot-house; of a purple color in the beginning, turning into a dark green bronze, all spotted with silvery white; in the free air, strewed with a carmine-red; stems, petioles, and the back of the leaves, a purple-red. A robust plant, with thick and strong stems, and a magnificent bearing. Price: one plant, 12 francs.

3.—Souvenir de Dr. Weddell.

Plant dwarfish, bushy, with small foliage, but of a coloring extremely remarkable; the inferior (under) face is of a dark blood-red, the superior (upper) face is strewed and pointed with spots and white dots, all of which is covered with a very marked rose color; the young leaves of a lively rose; altogether of a very attractive coloring. Price: one plant, 10 francs.

4.—Edward Andre.

Plant having the vegetation, the vigor, the size and form of the leaves of the *B. discolor;* flowering early. Very beautiful foliage; in its young age, of a dark purple, turning successively into a bronze-antique uniform color, with very brilliant reflections; the back of the leaves and the petioles of a dark red. A distinct and very beautiful variety. Price: one plant, 10 francs.

5.—Lucienne Bruant.

A rustic plant; half shrubby, very compact foliage; of remarkable vigor. Large leaves, cordiform, with a bright green inferior (under) face, rose washed around the edgings, which are shaded into purple; the superior (upper) face of a dark green, all spotted and strewed with points of a silvery-white; a magnificent variety. Price: one plant, 10 francs; three plants, 20 francs.

6.—A Carricre.

Plant with a branching and gracious form; of a nice foliage, entirely covered with a silver-colored and metallic white; spotted with carmine when grown; the back of a light rose, with purple edges; free bloomer. Price: one plant, 10 francs.

7.—W. E. Gumbleton.

A very vigorous plant; very thick, robust stems; bloom abundant; leaves very large; the inferior (under) face of a tender green, rose washed; superior (upper) face a lively green around the edges, with a shading of grey, lead color, very metallic. A variety remarkable for its luxuriant vegetation. Price: one plant, 10 francs; three plants, 20 francs.

8.—Countess Gabrielle de Clermont-Tonnerre.

Plant of medium size, compact and abundant foliage of a particular form, undulating and figured. At first its leaves are of a lively rose with sparkling reflections, turning successively into divers shades, up to a rosy-grey with green edges; its inferior face and petioles are of a dark purple-red; a very beautiful grouping of colors. Price: 12 francs.

10.—Marguerite Bruant.

Leaves of medium size, fine form, ending in a sharp point, with a silvery-white drawing upon a meadow-green ground, its back of a tender rose. A vigorous plant, of very robust and rapid growth, forming pyramidal thickets with a very leafy base. A variety with a great prospect for summer massing or bedding. Price: one plant, 10 francs; three plants, 20 francs.

[Nature has been very lavish in her gifts to the vegetable kingdom, and man by his efforts has added many strange combinations to these forms. In this case the art of man has succeeded in uniting two seemingly opposite forms (although of the same family) into a vigorous and healthy hybrid, preserving the characters of both, for which Mr. Bruant has also united the specific names of both parents as a general name for his hybrids. In reading his descriptions, however, we are almost inclined to think that *Discolor-Splendens* would have represented the original species more correctly than *Discolor-Rex*, as it seems evident to us that the *Splendens*, or silver-leaf variety, is the hot-house variety used for fertilizing the flowers of *B. discolor*. *Begonia Splendens* has a silvery-white leaf, veined and bordered with green, and is the type of all the silver-leaf varieties, having been introduced into Europe from Java among the first of the species. *Begonia Rex* was not introduced until 1858, and can only be considered as a type from the fact of its producing such distinctly marked (zoned) leaves. *Begonia Discolor* is a native of China, and was introduced into Europe under the name of *B. Evansiana*, in 1804; consequently, it is one of the oldest known species of all the Begonias. But be that as it may, the facts remain the same, and all plant lovers will rejoice with Mr. Bruant at the result of his skill as a hybridizer and successful propagator. We also feel highly honored by the privilege conferred on us of first publishing his descriptions of the new plants.—L. B. Case.]

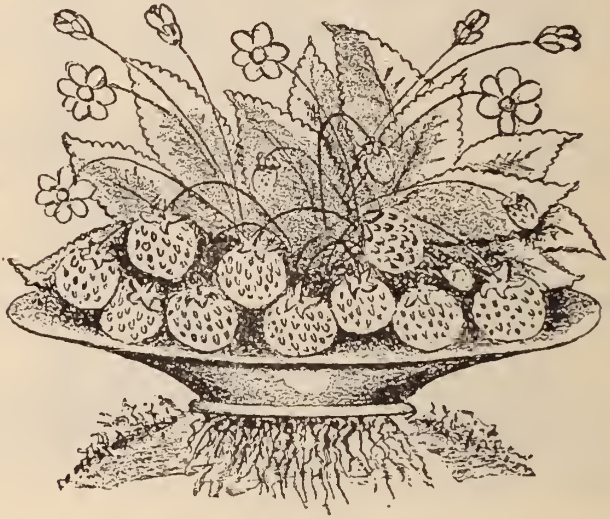


Fig. 101.

THE STRAWBERRY PROTECTOR.

We have just received from D. M. Dewey the above cut, (Fig. 101,) with a circular describing one of the most useful articles for fruit growers yet made. It is a cheap baked clay saucer, twelve to thirteen inches in diameter, with a hole in the center as shown in the cut. The great advantages in its use are: A much larger crop; much finer berries; cleaner, and free from dirt; mulching the ground; the retention of the rains to the roots of the vines; killing the weeds; earlier ripening; easier picking. They are turned over as a winter protection to the vines. Persons who have used it pronounce it the most important invention ever made in connection with strawberry raising.

Directions for Use.—Be sure in placing the Protector over the plants to draw the earth up around the outside ef the Protector, to prevent a circulation of cold air, and it will thus serve to fertilize the plant and keep it in good condition.

For show beds in Nurserymen's grounds it will prove a great desideratum. Every Nurseryman should have at once enough saucers ready for spring planting, to test them. The tests already made have proved so satisfactory that there can be no doubt of their great utility. For the family garden they will give universal satisfaction.

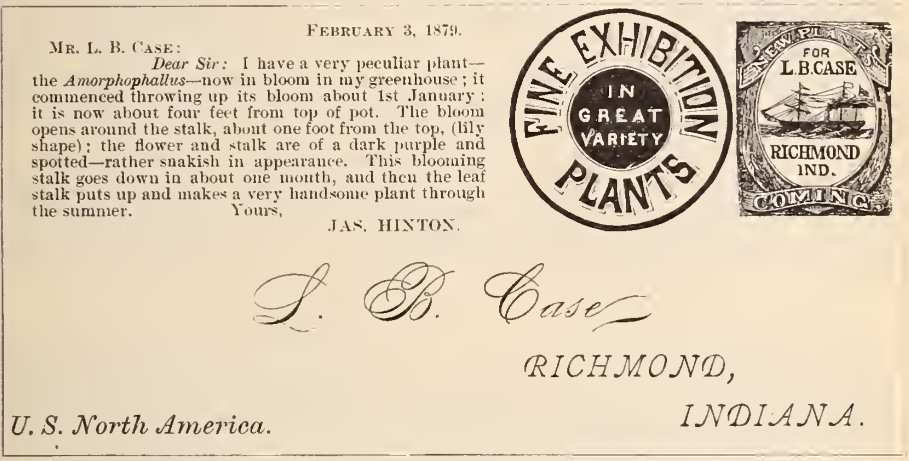
For full particulars, send for a descriptive circular to D. M. Dewey, Rochester, New York.

THE COLORED FRUIT PLATE,

Made for the use of nurserymen and tree dealers in the sale of fruit and ornamental trees, flowers, etc., is the invention of D. M. Dewey, of Rochester, N. Y. He has always made the finest work done in the country, always keeps a large stock, and makes more varieties, (numbering now over 2,000.) He has artists in his employ that have worked for him now over sixteen years. He sells these plates as low as any one can sell goods of equal quality; and as none of the imitators of his invention have either the stock or quality of his goods, it will be to the advantage of all wanting his stock to write him for catalogues and estimates before committing their orders to irresponsible parties.

CORRESPONDENCE

[We solicit the privilege of publishing extracts from correspondence, of interest to the general reader. Correspondence upon Botanical subjects respectfully solicited.]



FEBRUARY 3, 1879.

MR. L. B. CASE:

Dear Sir: I have a very peculiar plant—the *Amorphophallus*—now in bloom in my greenhouse; it commenced throwing up its bloom about 1st January: it is now about four feet from top of pot. The bloom opens around the stalk, about one foot from the top, (lily shape); the flower and stalk are of a dark purple and spotted—rather snakish in appearance. This blooming stalk goes down in about one month, and then the leaf stalk puts up and makes a very handsome plant through the summer. Yours,

JAS. HINTON.

FINE EXHIBITION PLANTS IN GREAT VARIETY

NEW PLANTS FOR L.B.CASE RICHMOND IND. COMING

L. B. Case

RICHMOND,

INDIANA.

U. S. North America.

New Orleans, La., January 17, 1879.

L. B. Case, Esq.—*Sir:* * * * We have had severe cold here this winter, and many plants have suffered destruction—particularly those of a succulent nature. We are not prepared for "zero" in this sunny clime. We longed and prayed for "Jack Frost;" he came furiously, and nearly froze the life out of those "Yellow Jack" had spared. B.

Manchester, England, November 21, 1878.

L. B. Case, Esq.—*Dear Sir:* * * * There is not much new to say, except that since I wrote you last I have visited the Botanical Gardens at Old Trafford, Manchester, on the occasion of the yearly flower show, which continues a week. It was the first time I had the pleasure of seeing the houses and grounds, and can assure you I came away well satisfied that I had spent a few hours there. The gardens are public, and are upheld by the people of Manchester. They are open daily, I believe; the entrance fee is sixpence, except on show days, when it doubles. Besides the yearly flower show, which is a general one, there are special ones; for instance, one week is taken up with roses, another with chrysanthemums, etc. Of course, the general one is of the most interest, and is visited by thousands each day. In comparing it with American flower shows, you don't find the abundance of cut bloom as with you, nor yet the floral designs. Neither do we find the cactus so good and so numerous as in the United States. In foliage plants, too, America excels. But for well grown plants, such as palms, ferns, orchids, azalias, vincas, pelargoniums, tricolor geraniums, and a miscellaneous lot of other plants, England takes the lead. There were plants exhibited from all parts of Great Britain; the best collection, as far as I could judge, was from the nurseries of B. S. Williams, of Upper Holloway, London. I cannot give you a description of the affair—it was simply immense. There seemed to be everything, from the skeletonized frond of *Adiantum* to the gigantic *Ficus elastica* of 30 feet. This plant was truly noble; you might climb it like an oak. On one side of it was planted a palm, with leaves the size of an ordinary door, being compound and recurved. On the other side rose a mighty cereus—a high dome of glass covered these three. I name this, because it was the center; from each side the houses branched off in a line for hundreds of yards. The palm house, fernery, and orchid house, were of very special interest; the number of orchids in bloom was astonishing; palms and tree ferns, that made you dizzy to look at their dimensions.

But I think that the sweetest plant I saw was *Todea superba*, under a glass in the fernery. In addition to the permanent exhibition rooms, there has been added, this last summer, a large tent, the frame work being of iron, which is a fixture; this frame work is covered with sail-cloth. This tent was devoted entirely to plants in bloom, all of which were specimens, and viewed from the foot of the tent it looked like a vast amphitheatre filled with bloom—the pelargoniums and tri-color geraniums being the most conspicuous. These were perfect; their height was about 12 or 15 inches, diameter about 30 inches, and literally covered with bloom—that is, the Lady Washington class. Another little feature I noticed was the way in which some of the varieties of the variegated Hedera were trained, on pyramidal wire frames; these they covered till they were invisible, being 3 to 4 feet high.

I had nearly forgotten to name the Aquatic department. It rather put one in mind of entereing some Paradisaical cavern—the house being sunk in the ground, and the light admitted from above. What between steps, rock and angles, one had to look out for his shin bones. However, here is a water-tank, and in it flourish many tropical beauties.

In front of this horticultural plenty is the Grand Promenade, decorated with evergreens in tubs, and beyond this a large area of grass, with its music gallery. The gardens are well worth a run through them. I. B.

MANCHESTER, ENG., February 13, 1879.

L. B. CASE.—*Dear Sir:* * * * Cold weather seems to be a general institution this winter. We have had thirteen weeks of steady frost and snow—so unusual to England, as the winters are generally pretty mild. This is the hardest winter since 1853. Of course, the cold is not so intense as with you, the lowest being 17 degrees below zero. I. B.

THE LILY NURSERY,
GHENT, BELGIUM, March 1, 1879.

L. B. CASE, ESQ.—*Dear Sir:* * * * * * This past winter has been the most severe since 1870. Early in December we had our first snow storm, which lasted for a week, and snow fell to the depth of about 4 inches, while an exceedingly cold northern wind prevailed, accompanied by a very low temperature during the following few weeks. The bed of snow on the ground very fortunately protected the hardy herbaceous plants, roots and bulbs from injury. A little later the weather changed, a southerly wind accompanied by rain set in, lasting three or four days, the snow disappeared quickly and the ground was nearly inundated. Then during the night the wind again changed to the north-east, with falling temperature, transforming the water into a field of ice. This exceedingly cold weather has continued for about six weeks; and I say with regret that trees and shrubs have suffered considerably, while roses and many choice shrubs are killed. The blossoms of fruit trees generally are not much injured. Besides the cold winter, we are having high water in our rivers, and the low adjoining fields are inundated, while from the same cause trade suffers very much, as steam ships, etc., cannot leave our ports regularly. For the past three weeks the temperature has moderated every day, occasionally interrupted by north-east or westerly winds, (both always cold,) and accompanied by hail and snow storms. From the 21st to the 26th of February we had another northerly snow storm, which was extremely severe.

Notwithstanding the lack of sunshine, my nice and most complete collection of *Hepaticas* come in full bloom. It is my favorite little winter flower, of which I mail you a beautiful colored plate, and would be pleased to mail them to every one on receipt of 12 cents in stamps.*

Hoping the weather will change soon, and that the mild spring will replace our severe winter, I remain, Yours, very truly,

J. VAN DER SWAELMEN.

[*As United States Postage stamps would be of no value in Belgium, we will receive the subscription in stamps and forward the orders with our commercial transactions.—L. B. CASE.]

BEGONIAS SHEDDING THEIR FLOWERS.—Many Begonias have a vicious habit of shedding their male flowers unexpanded. I observe this to occur in plants of different species in different greenhouses, and in some plants out of a number potted and treated alike. Can any of your correspondents assign a reason and suggest a remedy for a habit which detracts so seriously from the successful cultivation of this beautiful family of plants?—P. [Begonias shed their male flowers when not sufficiently watered, or when their roots are destroyed by too much moisture. Some varieties, however, always drop their male blossoms, and such sorts should be thrown away; others drop their male blooms when planted out-of-doors, but retain them when cultivated under glass.—L.]

HORTICULTURAL DIRECTORY.

Business Cards for all kinds of business pertaining to Horticulture, except for plants (which is our special business) inserted on this page at 25 cents a year, always in advance. Your Order Solicited.

BOUQUET PAPER.

M. M. Bayersdorfer & Co.,
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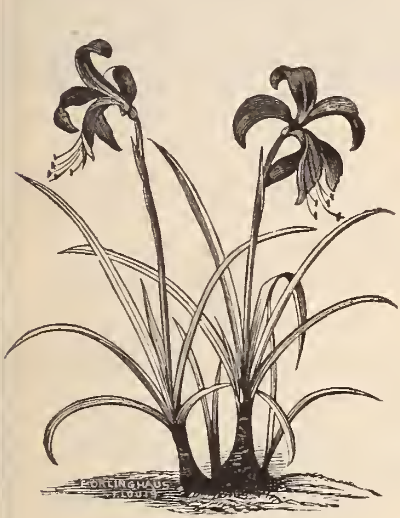
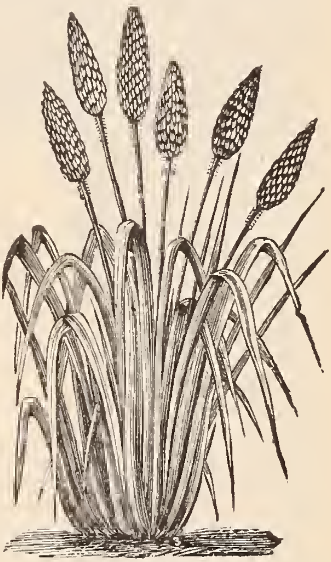


Amaryllis Formosissima.



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“ Eyresii, white flowers	25
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“ ottonis, yellow flowers, pink pistils	35
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“ phyllanthoides, flowers scarlet	25
“ truncatum crenatum, flow. crimson	25
“ “ violaceum, flowers violet	25
Mammillaria gracilis	25
“ pusilla	25
“ stellata	25
“ sphœrica	25
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“ rafinesquii, yellow flowers, hardy	25
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“ rotundifolia, small foliage	25
“ sanguinea, violet shaded foliage	15
“ scaphylla	25
“ secunda, green leaves	15
“ “ glauca, silvery leaves	30
Euphorbia pendula	25
Hechtea Ghiesbreghtii	1 00
Mesembryanthemum amabilis, flowers yellow	15
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“ cordifolium, flowers pink	15
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“ dolabraform	15
“ pinnifolia, flowers scarlet	25
“ “ alba, flow. white	25
Pachyphytum bracteosum, silvery leaves	25
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Rochea falcata, silvery white leaf	30
Sempervivum arachnoideum, flowers rose-color	25
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“ Woodfordiana, trailing	25
“ grandiflora, erect growing	50
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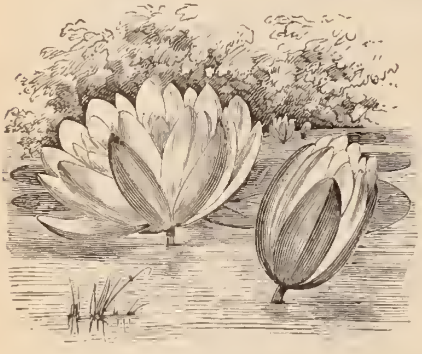
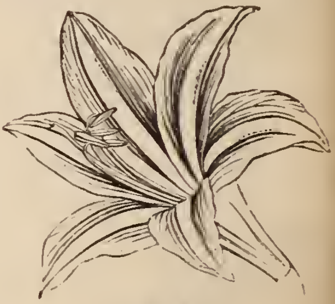
“ ribonium, erect	50



Nymphæa Odorata.



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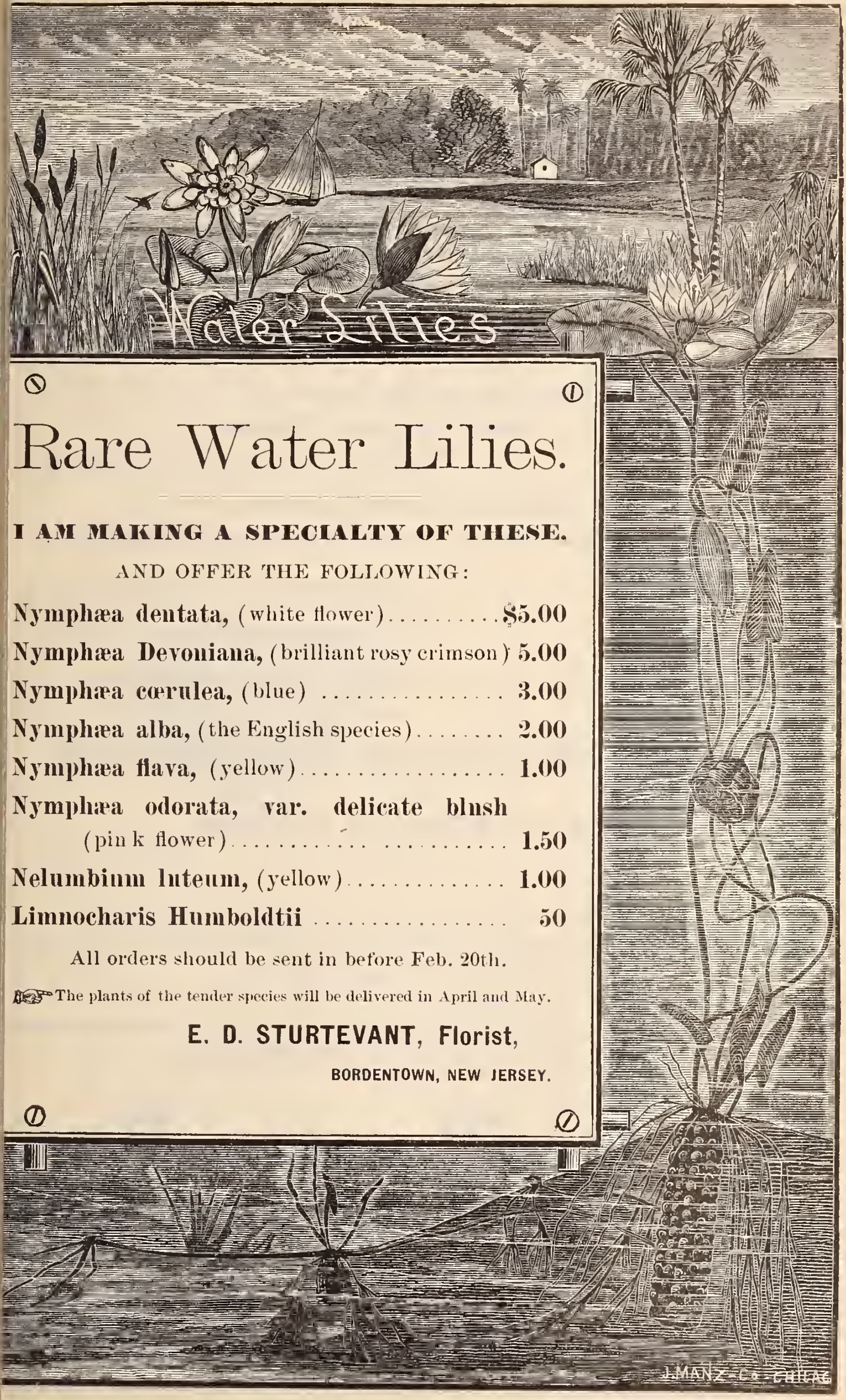

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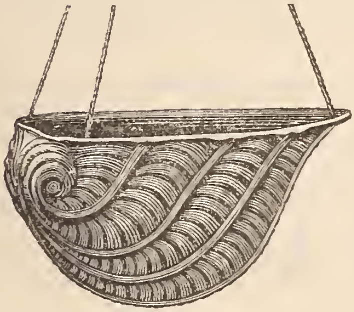

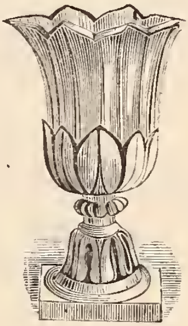

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Vol. II. JULY, 1879. No. 3.

L. B. CASE'S

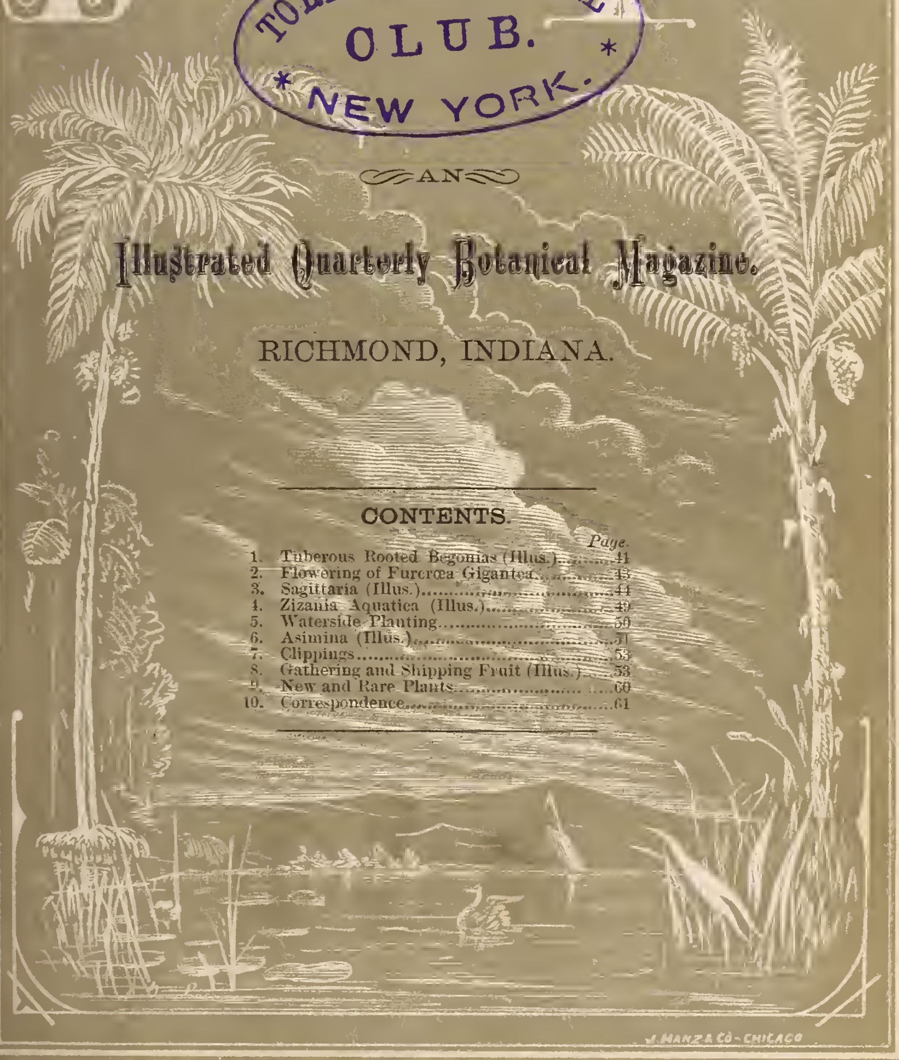
BOTANICAL INDEX

TORREY BOTANICAL CLUB. * NEW YORK. *

AN

Illustrated Quarterly Botanical Magazine.

RICHMOND, INDIANA.



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BOTANICAL INDEX

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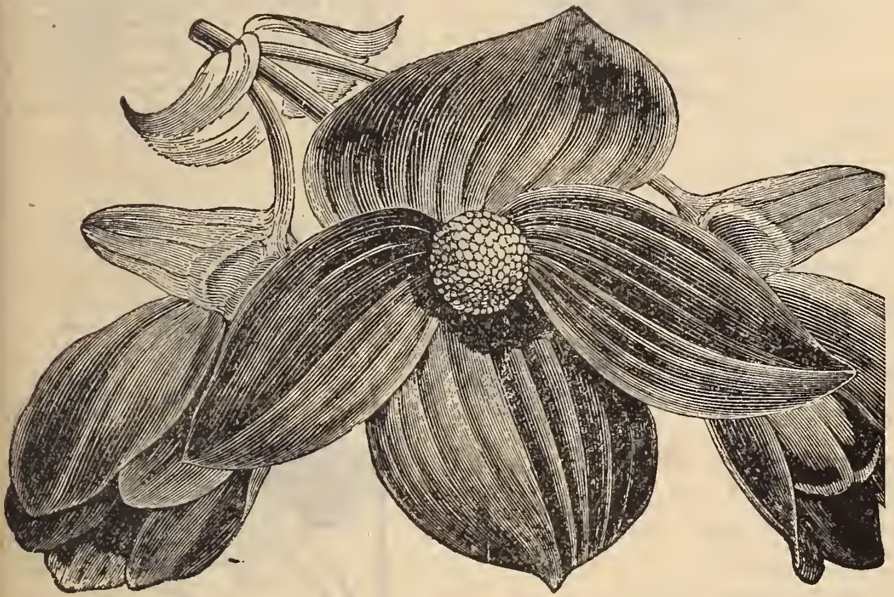


FIG. 102.

TUBEROUS ROOTED BEGONIAS.

BY DANIEL BARKER, BRAMBELTON, NORFOLK, VA.

A FEW years ago it occurred to me that the "Tuberous Rooted Begonias" possessed many qualities which, if properly developed, would bring them to the very front as greenhouse, window, and bedding plants. They had not then had that attention bestowed upon them that their merits deserved. I resolved to try it in various ways. I procured in Europe and this country packages of seed, which were (save one) very disappointing. From one packet I had a few which were decided improvements, and which have been the parents of some very fine varieties, adapted alike for the conservatory, dwelling house, rustic baskets, and for bedding out in the flower garden. One of the principal steps made was in variety of color. The best of each kind was carefully selected, taking into account color, habit, and constitution. For some time the same process has been going on, the result of which is very satisfactory. The seeds this season (saved from the finest varieties) have germinated more freely than ever, and the plants are now numbered by the thousands. We have a few varieties possessing all the requisites of first rate decorative plants, either for the greenhouse, garden, table decoration, or grouping with ferns, etc., in large baskets, etc.

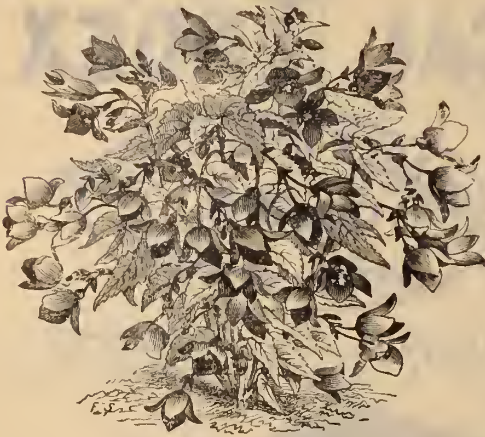


FIG. 103.—*Begonia Hybrida.*

CULTURE BY SEED.

In order to have plants in flower by June, the seed should be sown in March, in a well drained seed pan, filled with light sandy soil (*entirely free from any mixture of manure, however well decomposed*). The seed should be slightly pressed into earth and the pan placed in a moderately warm place, placing a piece of glass over the pan, and covering the glass with thick paper until the seed have germinated, when all covering must be removed, and the young plants shaded during bright sunshine. When sufficiently advanced they should be pricked into pans of light soil, say one part good loam and one of finely sifted leaf soil. When about one-half inch high pot singly in three-inch pots, keeping them in the greenhouse. When well established in the pots the season will be sufficiently advanced to shift into pots in which to flower, which need not exceed six inches in diameter. The soil as before recommended, with the addition of about one-fourth of well decomposed cow dung. For the garden we plant out about May, when the ground is in good working order. During warm weather they should be well watered, and a top dressing of well rotted manure applied in July.

During the months of July, August, September and October, these beautiful free-blooming plants are amongst the most beautiful of all our summer-blooming plants, and as ornaments for the greenhouse, garden, dwelling, rustic or hanging baskets, they are unsurpassed.

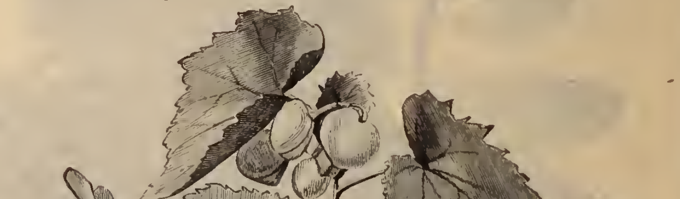


FIG. 104.—*Begonia Weltoniensis.*

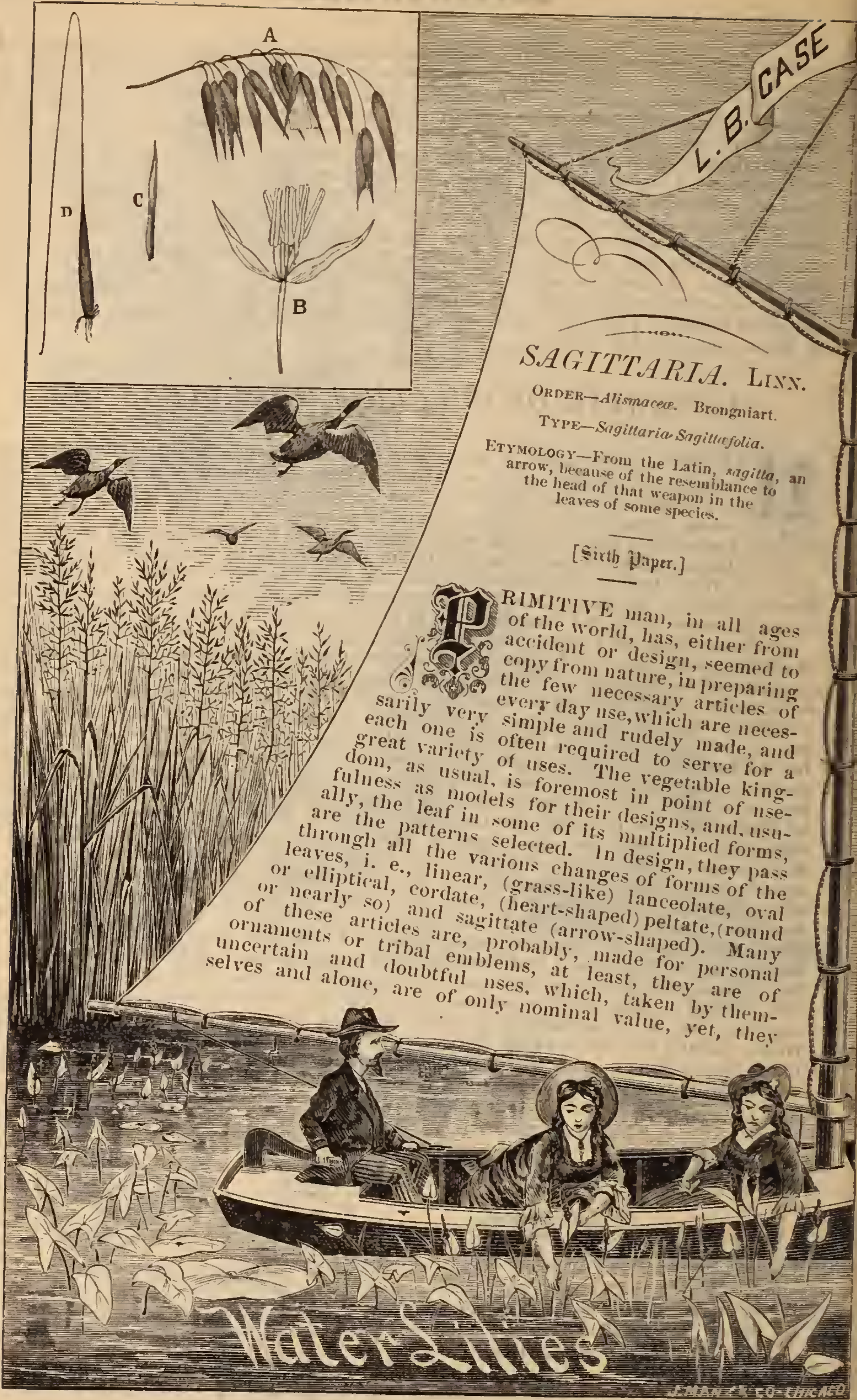
[If there is any one class of plants more than another that we particularly admire, it is the Begonia, and about half suspect the large majority of plant-lovers share our admiration for them, or would, if they could only succeed in growing them to perfection with anything like ordinary culture. But here is just where the trouble and disappointment often arises, for every one that has attempted to grow Begonias, know how difficult it is to prevent the soft and succulent, or almost watery, leaves and stems from decaying, (damping off,) whenever we have a few days of damp weather. This is especially the case in the central portion of the whole North American continent, where changes from extreme heat to very cold are often experienced, even in a very few hours. Our correspondent, Mr. Barker, is probably the most successful Begonia grower in America, and his experience and observation, even in a short article, will have more weight with plant-growers than a whole volume of theories, or even instructions, from a less successful one. We are very glad to have the privilege of publishing this communication, and hope it may be our good fortune to have more of the same sort from the pens of our practical and successful plant-growers. We commend the above article from Mr. Barker to a careful study. Thinking, perhaps, a few good illustrations would be of value to the article, we have given first, a figure of a flower of one of the new hybrids, Fig. 102, of which the varieties are *legion*, and are of all colors and shades of color from deep scarlet to pure white. The flowers, of some varieties, are very large and single, while others are semi-double, or even double. Fig. 103 represents a well grown plant in full bloom and splendid foliage. Fig. 104 represents a single stem of the well known old variety, B. Weltoniensis.—Ed. Index.]

FLOWERING OF FURCRŒA GIGANTEA. Vent.

UNDER the above name, is often seen in cultivation, a plant strongly resembling the ordinary Agave or Century plant in general appearance: in fact, it was considered an Agave until a French botanist, Ventenet, divided the genus Agave, and arranged under the name of *Furcræa* (in honor of M. Fourcroya) a few species with *Agave fœtida* (*Furcræa gigantea*) as the type. This species is a native of South America, and rather extensively introduced into the West Indies and adjoining Islands as a decorative plant, where M. E. Reeves, Esq., of Richmond, Indiana, procured two small plants, during a visit there in the Winter of 1869, and brought home to help beautify his already beautiful grounds.

It is so seldom they bloom in this latitude, that a daily record of the growth of the flower stem may be of interest. The plants were standing on the lawn, and had commenced to throw up the flower stalk when first noticed, (Aug. 2d) but was still enclosed by three large leaves which soon unfolded. The first plant to flower measured eight feet and nine inches, as it stood in the tub, from tip to tip of the longest leaves at the base; or each leaf about four feet and two inches long, with five inches for thickness of the body of plant. The second plant commenced to throw up the flower stem August 12, but was soon removed to the National Soldiers' Home, Dayton, Ohio, and placed in the Martindale Conservatory, where the flower stem reached thirty-four feet in height, and ripened its seed. Both plants were, probably, the same age, and about the same size; the Dayton specimen, perhaps, growing a little the strongest. The leaves of the first one to bloom were broad and ridged, like all Agaves, at the 20th of August, but as the stem increased in height the leaves gradually withered, until by the time the flower stalk was fifteen feet high, the leaves had lost their usual tropical growth and vigor; still, however, remaining green. The plant was measured every morning about 9 A. M., the foot of the pole used for measuring resting upon a leaf close by, and at the same height of the base of the flower stem, which was ten and one-half inches above the level of the earth in the tub. Being so very tall it would be impossible to protect it without a house built especially for its accommodation, which was not thought desirable, and the early frosts chilling the flowers they did not come to perfection. After the chilling of the plant (Sept. 14th) it grew so little each day that it was scarcely perceptible; but it continued to increase in height until it reached 29 feet 2 inches.

Aug.	2.	1	ft.,	7½	in.	
"	3.	2	"	7	"	Air cool with rain.
"	4.	3	"	2½	"	Air cold.
"	5.	3	"	11½	"	
"	6.	4	"	10	"	Thermometer 56° last night.
"	7.	5	"	8	"	Warm night.
"	8.	6	"	5½	"	
"	9.	7	"	4	"	Cold and rainy,
"	10.	8	"	3	"	Cold and rainy.
"	11.	9	"			
"	12.	9	"	6	"	
"	13.	10	"	2	"	
"	14.	10	"	8	"	Cool and clear.
"	15.	11	"	4½	"	Cool and clear.
"	16.	12	"	2	"	
"	17.	13	"	10½	"	
"	18.	14	"	9	"	Hard cold rain.
"	19.	15	"	6½	"	
"	20.	16	"	1½	"	
"	21.	17	"			
"	22.	17	"	4	"	Nights cold.
"	23.	18	"			
Aug.	24.	18	ft.,	5	in.	Clear and cold nights.
"	25.	19	"	4	"	
"	26.	19	"	7½	"	
"	27.	20	"	4	"	
"	28.	20	"	8	"	Cold rain.
"	29.	21	"	4	"	
"	30.	21	"	9	"	
"	31.	22	"	6	"	Cold rain.
Sept.	1.	22	"	8	"	Cold rain.
"	2.	23	"	4	"	Clear and cold.
"	3.	23	"	8	"	
"	4.	24	"	1	"	
"	5.	24	"	2	"	
"	6.	24	"	4	"	
"	7.	24	"	8½	"	
"	8.	24	"	11	"	
"	9.	25	"	3	"	
"	10.	25	"	11	"	
"	11.	26	"	3	"	
"	12.	26	"	6	"	
"	13.	26	"	8	"	
"	14.	26	"	9	"	



SAGITTARIA. Linn.

Order—*Alismaceæ*. Brongniart.

Type—*Sagittaria Sagittæfolia.*

Etymology—From the Latin, *sagitta*, an arrow, because of the resemblance to the head of that weapon in the leaves of some species.

[Sixth Paper.]

PRIMITIVE man, in all ages of the world, has, either from accident or design, seemed to copy from nature, in preparing the few necessary articles of every day use, which are necessarily very simple and rudely made, and each one is often required to serve for a great variety of uses. The vegetable kingdom, as usual, is foremost in point of usefulness as models for their designs, and, usually, the leaf in some of its multiplied forms, are the patterns selected. In design, they pass through all the various changes of forms of the leaves, i. e., linear, (grass-like) lanceolate, oval or elliptical, cordate, (heart-shaped) peltate, (round or nearly so) and sagittate (arrow-shaped). Many of these articles are, probably, made for personal ornaments or tribal emblems, at least, they are of uncertain and doubtful uses, which, taken by themselves and alone, are of only nominal value, yet, they are of great service in studying the development and progress of civilization and arts, from the infancy of the human race to the present day. We say "primitive man seems to copy from nature," wishing to emphasise the word *seems*, for no one will assume, at this late date, to know what their motives or designs were; all we know, is, the analogy is very striking, and whether they used the patterns set before them or not is immaterial to our comparison; suffice it to say, there certainly is a strong resemblance, and many of the forms of pre-historic relics have received the popular name of "leaf-shape" from Archæologists and pass into history as such. But the analogy does not stop here, for within historic times the vegetable kingdom has most certainly furnished the designs for some of the choicest gems of workmanship of classic times. The leaves of the *Acanthus* (*A. Mollis*) are known to have furnished the old Greek sculptor with the pattern for the capitol which surmounts the Corinthian Column, while the leaves of *Laurus Nobilis* furnished the material for the Wreath of Laurels, so superstitiously prized by the old Greek and Roman warriors, statesmen and victors, at their National Games, and which, without doubt, was superseded in the following ages by the Golden Wreath of Laurels, i. e., Imperial Crown, leaves of which were found in the old Tombs of the Kings at Mycenæ. This subject could be carried to a very indefinite length, but, whether we wish to or not, we must dismiss it, and see what we can learn of our chosen subject on Water Lilies for this number of the INDEX, *The Sagittaria*. Here we have, in mature specimens, the typical form of the foliage of all Water Lilies in their immature condition, viz, the arrow-shaped leaves, for the leaves of all aquatic plants, (except grass) so far as we know, are inrolled and present an arrow or spear-shaped point at the end of the stalks, in their growing or young condition, particularly, before reaching the surface of water, when they expand or unroll into their normal condition, viz, arrow-shaped, heart-shaped, oval or round, according to the species.

In the last number of the INDEX we felt called upon to offer an apology for our seeming stretch of imagination in applying the term "Water Lily" to the *Pontederia*, and now, we would again repeat the same expression in connection with *Sagittaria*, and would add in continuation, that there is no actual affinity or relationship existing between the different members of the group of so-called Water Lilies as we have arranged them together, for in a botanical nomenclature some are arranged near the first of the series, while others are placed near the last of the list of plants; according to the structure of the fruit and flowers, or to make the comparison as plain as possible, let us illustrate by saying: The *Nymphæa*, according to the scientific classification of Sir. Joseph D. Hooker, in his *Descriptive and Analytical Botany*, is arranged as the 10th botanical Family of plants, while the *Pontederia* are placed in the 46th Family (*Pontederaceæ*) with 35 distinct changes in the structure of the fruit and flower from the first family to the last one. They are simply a miscellaneous selection of aquatic plants, chosen from several distinct Families, whose habits and manner of growth seem to be very similar, but still without any scientific or natural characters in common with each other. As we have given the scientific characters of each Family, Genus or Species of the Water Lilies as occasion required, we must also add that of the *Sagittaria* here.

GENUS SAGITTARIA. LINNÆUS.

[*As elaborated by Engelmann, Hooker and others.*]

Marsh or aquatic, perennial, herbaceous, stoleniferous plants, with fibrous roots; and producing subterranean, tuberous corms, with a milky juice. STEMS, scape-like, radical, rosulate; sheathed at the base by the bases of the long, cellular petioles, of which the primary ones are usually devoid of a blade; the secondary ones usually have a long, linear blade, and all the subsequent ones develop a more or less perfect sagittate blade, except when they are submerged, when they are replaced by long, linear or spathulate phyllode. LEAVES (blades), floating or erect, of various shapes—linear, oval, cordate, oblong or sagittate, veined and reticulated with prominent cross veinlets, converging towards the top of the leaf, and united by secondary transverse nerves. FLOWERS, on long, angular, leafless scapes, usually in a 3-whorled raceme, from the axils of persistent, membranous bracts; monœcious, but having the fertile and sterile flowers on the same stock, the lower ones being fertile and the upper ones sterile. SEPALS, three, small, persistent. PETALS, three, a delicate paper-white, much larger than the sepals, imbricated in the bud, withering. STAMENS, numerous, rarely few. OVARIES, many, crowded in a spherical or somewhat triangular depressed head on a globular receptacle. ACHENIA, flat, fleshy, membranous marginal, winged and beaked.

Perhaps, nothing is more interesting than the study of the geographical distribution of plant and animal life, even to a person not particularly interested in botany or zoology; in proof of which, we would note the marked attention always paid to a traveler, both in the lecture room and, also, in the conversation, whenever treating of the flora or fauna of any strange or almost unknown country. Assuming, then, that our readers are as much interested in this subject as we are, we give a table of species and varieties, together with the localities where they are known to naturally exist; but must first say, that the *Sagittaria* present about the least distinct specific characters, probably, of any genus of plants. In the far north they are often small and dwarfed, while "as we approach the tropics the leaves (blades) are found two feet long, with stems nine feet in length; and each flower is often two inches across."—(*W. H. Dall.*) Consequently, we would, probably, be justified in saying many of the so-called species (given in the usual lists) are so closely allied in their specific characters, that oftentimes they are only varieties or abnormal forms, produced by climatic changes or changed condition of growth of only a few original species. Be this as it may, it is not our province to attempt a rearrangement, but, simply, to treat of the established order of nomenclature as already in existence. It may be well, however, to say in this connection, that Drs. Gray, Engelmann, and other careful students, are fast reducing the number of so-called species to their proper sphere, i. e., *varieties*, as time and opportunity offers.

SPECIES.	VARIETIES.	SYNONYMS.	HABITAT.	DATE.
Acutifolia, Linn.		Not of Pursh.	West Indies.	1820.
Angustifolia, Lindle.		Not of Pursh.		1812.
Calycina, Engelmann.			North America.	1853.
"	Variety *Spongiosa*, Eng.		North America.	1875.
"	" *Fluitans*, Eng.		North America.	1875.
"	" *Grandis*, Eng.		North America.	1875.
Dontana.			Nepal, India.	1820.
Falcata, Pursh.		*S. lancifolia*, Michx. expart, not of Linnæus.	North America.	1812.
Graminea, Michx.		Simplex of Am. Authors, not Simplex of Pursh.	North America.	1812.
"	Variety *Acutifolia*, Pursh.	Not Linnæus.	North America.	
"	" *Platyphylla* Eng.		North America.	1875.
Heterophylla, Pursh.			North America.	1822.
"	Variety *Elliptica*, Eng.		North America.	1875.
"	" *Rigida.*	*Sagitaria Rigida*, Pursh.	North America.	1806.
Lancifolia, Linn.		Not *Lancifolia*, Michx.	North America.	1787.
"	Variety *Falcata*, Push.	*Sagittaria falcata.*	North America.	
"	" *Ovata*, Red.		West Indies.	
Natans, Michx.			North America.	1812.
"	Variety *Lorata*, Chabman.	*S. Pusilla*, Pursh, expart.	North America.	
Obtusifolia.			China.	1804.
Pusilla, Nuttall.		Not *S. Pasilla*, Pursh.	Eastern U. S., N. A.	
Sagittifolia, Linn.			Europe.	Old.
"	Fl. Pl.		Europe.	
Sinensis.			China.	1812.
Variabilis, Engelmann.		*S. Sagittæfolia* of Am. Authors and Simplex, Pursh, expart.	North America.	– 1840.
"	Variety *Angustifolia*, Pur.	Not of Lindley.	North America.	
"	" *Diversifolia*, Eng.		North America.	1875.
"	" *Gracilis.*	Species *Gracilis*, Pursh.	North America.	
"	" *Hastata.*	" *Hastata*, Pursh.	North America.	1818.
"	" *Latifolia.*	" Latifolia, Willd.	North America.	1819.
"	" *Latifolia*, Fl. Pl.		North America.	
"	" *Obtusa.*	Species *Obtasa*, Willd.	North America.	1820.
"	" *Pubescens.*	" *Pubescens*, Muhl.	North America.	

In studying the geographical range of the *Sagittaria*, as presented in the above table, we find them "more or less abundantly distributed over the northern hemisphere, but rarer in the tropics."—(*Hooker.*) Sir Joseph Paxton gives no tropical species in his list, and Grisebach, in his *Flora* of the *British West Indian Islands*, describes only two species, the habitat of which, he gives as "Jamaica and Cuba to (?) Guina, South America." The list of localities at our command is very meager and indefinite, consequently, very unsatisfactory; enough is known, however, to enable us to arrive at the following conclusion for North America: "Common throughout all the Atlantic States; abundant throughout all the central portion of the Continent, from the Gulf of Mexico to the Great Lakes; and very generally distributed along the Pacific coast, from California to British Columbia, inclusive. For its northern limit, we will quote from a private letter recently received from Prof. George W. Dawson, of the Canadian Geological Survey, who has very satisfactorily settled the question. He says: "Sir J. Richardson includes it in his list of plants, from the zone embracing from 45° to 55° on the eastern side of America, and 49° to 38° on the western coast. He marks it as common to the eastern wooded district of the eastern provinces (Canada) and the Pacific coast, but does not give it in his list of plants found north of the Arctic circle. The plant occurs in British Columbia, but I cannot give the precise localities. Prof. Macoun enters it as found in the Peace River and Athabasca county, as well as in British Columbia and the Saskatch-

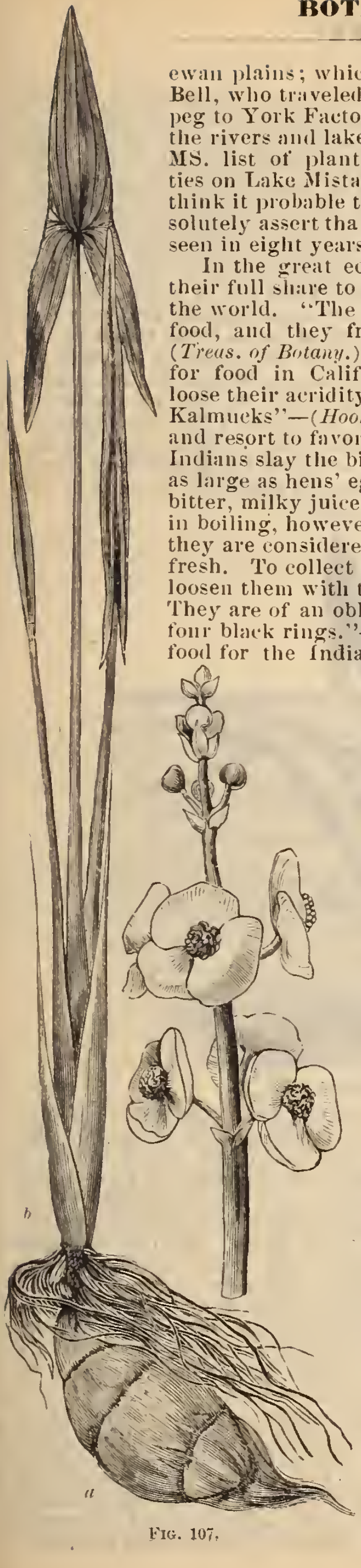


FIG. 107.

ewan plains; which gives it a considerable northern range. Prof. Bell, who traveled last summer from the west end of Lake Winnepeg to York Factory on Hudson Bay, tells me that it is common on the rivers and lakes along that rout. It is not mentioned in a small MS. list of plants, collected by one of the Geological Survey parties on Lake Mistassini, (Lat. 51°; Lon. 75°;) some years ago, but I think it probable that it may go even so far north." "I could not absolutely assert that it does not occur in Alaska, but it has not been seen in eight years assiduous collecting."—(*W. H. Dall.*)

In the great economy of nature the *Sagittaria* have contributed their full share to the support of the human family in all parts of the world. "The Chinese cultivate *S. Sinensis* very extensively, for food, and they frequently represent them in their drawings."—(*Treas. of Botany.*) They also collect the tubers of the wild plants for food in California. "The feculent rhizoms of *S. Sagittæfolia* loose their acridity by desiccation, and serve as food to the Tartar Kalmucks"—(*Hooker.*) "Aquatic birds are fond of them, (tubers) and resort to favorite spots in Spring to feast upon them, when the Indians slay the birds for their own feasts; the tubers are generally as large as hens' eggs, and are greatly relished when raw, but has a bitter, milky juice, not agreeable to civilized man; this is destroyed in boiling, however, and the roots are rendered sweet and palatable; they are considered excellent when cooked with meat, either salt or fresh. To collect the roots, the Indians wade into the water and loosen them with their feet, when they float up and are gathered. They are of an oblong shape; in color, whitish-yellow, banded with four black rings."—(*U. S. Agricultural Rept., 1870.*) "They serve as food for the Indians of Washington Territory, under the name of Wappatoo."—(*Dr. J. G. Cooper, Vol. 12, Pacific R. R. Survey.*) "In shallow ponds and muddy margins of lakes and rivers throughout the North-west, this plant, so variable in foliage and so abundant in distribution, furnishes an important article of native food, in the tubers which beset its fibrous roots. These tubers, (from the fact of their affording nourishment to the larger aquatic fowls, which congregate in such abundance about the North-western Lakes,) are called by the Chippewas Wab-es-i-pin-ig or Swan Potatoes, a name which has been naturally appropriated to several streams in this region.—Wabesipinicon, meaning the abode of the Swan Potatoe. The tubers frequently attain the size of a small hen egg, and are eaten by the Indians, with whom they are a great favorite. In their raw state they contain a bitter, milky juice, but in boiling, become sweet and palatable."—(*C. C. Parry in Owen's Survey of N. W.*)

From the foregoing extracts, it will be seen how universally they have been employed to assist in the maintainance of the human family, and probably we know very little, yet, how extensively they have been employed in North America. As for their medical qualities, we find only a single recorded notice. Sir J. D. Hooker says: "they have been prescribed, but without good reason, for hydrophobia." Perhaps, our limited observation and knowledge of this particular plant, would not add anything of general interest to the fund already accumulated; but as some doubts exist in regard to their always producing a tuber, we will say: We supposed, as many others apparently do, that those found in the central and eastern portion of the United States, (North America) produced no tubers, but now find it is a mistake. We have collected them from a great many localities in Ohio, Indiana and Illinois, and find in early spring a solid, brittle, tuberous corm (Fig. 107) down deep in the earth, being the germ from which the plant starts in spring. From the corm, (Fig. 107, a,) at the first approach of warm weather, starts a large, porous rootstock, reaching up to near the surface of the earth and there throws out innumerable fibrous roots, (Fig. 107, b,) which is the true crown from which spring the leaves, flowers and stolens, and is also the plant centre during summer. By the first of June the milky juice (starch, or saccharine, &c.,) has usually been absorbed by the new growth of the plant, and the corm is then a soft and flexible, or spongy, mass, reminding one of a sprouted and growing potato, while by the middle of July or first of August we could not find any corm, but found decayed masses which we were reasonably certain were the remains of the former corms. Fig 109 shows a cross section about natural size of a corm in early spring before it has lost its form and vigor. In our correspondence we find very few botanists or collectors that have any definite knowledge of corms being found on the Eastern or North Western plants, and all seem to regard the *Sagittaris* in these localities as not producing any tubers, for it is said that no herbarium in the country shows a specimen with a tuber attached that was collected in the Eastern portion of North America. This may be very easily explained by the fact that the crown of roots appears so perfect that collectors evidently concluded this to be all of the plant, or perhaps they were collected when the corm was absorbed by the growing plant. Now the above observation, we believe, will be found to be true in all parts of the country if collectors will *collect early and dig deeper*.

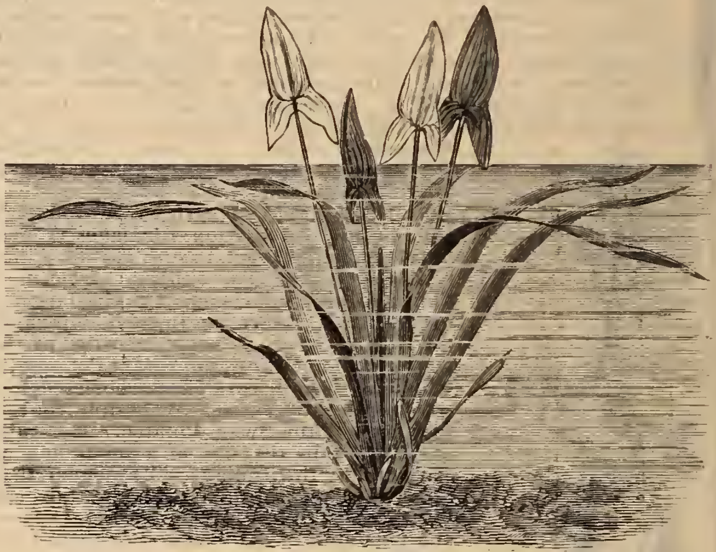


FIG. 108.—*Showing the Phyllodium.*

In addition to tuberous and fibrous roots, the *Sagittaria* present the feature of producing *Stolens* or long, creeping roots, (Fig. 110) just beneath the surface of the earth. They start from the stem, and usually from just above the fibrous roots, or from the upper portion of the stock covered with the fibrous roots, and creep out horizontally from the plant in all directions. We do not now recall a single genus of plants, that present so many different forms of development in each plant, as the *Sagittaria*. First, the roots are of three entirely distinct forms, (often on the same plant,) the tuberous, fibrous and stoloniferous. Next. the leaves are sometimes phyllodia, (submerged and riband-like) others are an elliptical, erect blade upon a tall, round or slightly angular stem, and, lastly, the leaf developed into its true form—arrow-shaped. Again, let us look at the flower; the lower ones are usually fertile, producing seed to perpetuate its kind, while the upper ones are sterile and barren; or each flower stock producing flowers with the sexes separate, and still on the same stock.

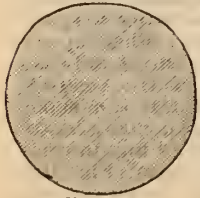


FIG. 109.

The flowers are borne on long, leafless, branched stems, (Fig. 107) well above the foliage, with pure white petals and a yellow centre, (stamens) usually single, but occasionally S. Sagittæfolia and S. Variabilis var. latifolia have been found growing wild with double flowers. The European Nurserymen offer these varieties for sale at from 6d. to 2s. 6d. each, which shows how readily they are increased, but we never heard of their being offered in

America. It is one of the queries of the plant trade, why these beautiful plants are not more extensively used by American plant growers; but we must unwillingly admit, that our people cannot, as a rule, be induced to endure the presence of *any plant* that is *so very common*, no matter how beautiful it may be, or how appropriately it may fill a certain space. For growing in an aquarium we find few plants better suited; and for a small lake or pond, it has few equals. In their natural condition they are found growing in soft, muddy or sandy ground; consequently, the conditions for a successful cultivation must be continued, viz: grown in soft, loamy soil, while if for pot or tub culture, a layer of coarse sand or small pebbles in the bottom of the tub, is always desirable for all kinds of aquatic plants; at the same time, a layer of clean, fine sand, spread over the top of the soil, not only looks bright and cheerful, but very materially assists in purifying the water. Of course, the tropical species will not withstand any frost, but must be protected during Winter the same as all other tropical plants; but they can be allowed to remain in a neglected corner until they are required for the lawn or show-house.

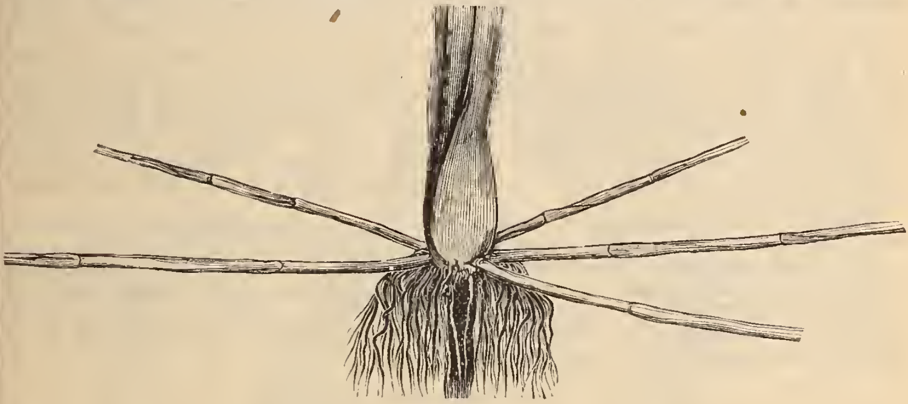


FIG. 110.

Unlike many other species of plants, they survive the ill treatment and encroachment of civilization, and seem to flourish under its (to them) baneful influence. They were the last representatives, of the vegetable kingdom, to linger on the banks of the River Thames, in the heart of London, when that great metropolis banished dame nature from her presence, and substituted on her throne the modern conquerors—CIVILIZATION and COMMERCE.

ZIZANIA AQUATICA. LINN.

In the picture of Water Lilies, on page 44, our artist has very tersely introduced, as a background, a view of the growing grain of *Zizania Aquatica, Linn.*, the Wild Rice of North-western America, as it is often seen growing in the lakes, rivers and swamps; and which is in every way a fit companion for the *Sagittaria*, for many reasons. First, it is one of the most important native grains in the Northern portion of America, rivaling the *Sagittaria* in its economic value, furnishing a very important portion of the food of the North American Indians; while immense flocks of wild swan, geese ducks &c., depend almost entirely upon it for sustenance during a large portion of the year. Again, the *Zizania*, like the *Sagittaria*, is monœcious and contains both sexes on the same stock, the upper ones being male and the lower ones female. The picture represents the panicles of *Zizania*, as seen in Fall, with no grain adhering to the lower branches, but still retaining the semblance of grain on the upper ones. The upper portion, being male flowers, produce no grain, and the barren, pistillate, chaff-like flowers remain attached to the stock for a long time, often a year, but the fruitful (staminate) flowers, (awns) after ripening the grain, drop off at the slightest touch and sink to the bottom of the water, where they remain in nature's store-house of food for aquatic birds. This may explain, perhaps, the cause of the great abundance of game on our western lakes and rivers, at certain seasons of the year.

In the upper left hand corner of the same picture, (Page 44) we represent the various parts of the grain and flower of the *Zizania*. Letter *a* represents a single grain bearing branch, in flower; *b*, a single, perfect staminate flower; *c*, a single, ripe grain, as often seen, and *d* represents an awn (beard or chaff) enclosing the grain. The awn is usually about one and one-half or two inches long, adhering very persistently to the grain. The grain is enclosed in a hard, horny skin, from one-half to three-fourths of an inch long, and contains an exceedingly large quantity of farinaceous matter.

Many attempts have been made to cultivate it in Europe, as an article of food, but it is now abandoned. It is still thought, however, by many economists, to be the future grain plant, intended by nature to produce the bread supply of the North. The Indians (Sioux and Chippawas) gather it by paddling their canoes through the standing grain, and shaking it off into their canoes as they go along. After being gathered it is "laid on scaffolds, about four feet high, eighteen feet wide, and twenty to fifty feet long, covered with reeds and grass; and a slow fire is maintained beneath for thirty-six hours, so as to slightly parch the husks that they may be easily removed; its beard is tougher then than rye. To separate it from the chaff, a hole is made, in the ground, a foot wide and one foot deep, and lined with skins; about a peck of rice is put in at a time; an Indian steps in, with a half-jump, on one foot, then on the other, until the husk is removed. After being cleaned, the grain is stored in bags. It is darker than Carolina rice. (From which it is entirely distinct, both botanically and economically.—ED. INDEX). The hull adheres tightly and is left on the grain, and gives the bread a dark color when cooked. An acre of rice is nearly or quite equal to an acre of wheat, in nutriment. It is very palatable when roasted, and eaten dry."—(*U. S. Ag. Rep., 1870.*) The Sioux call it "*pshu*," and the Chippawas, "*man-om-in*."

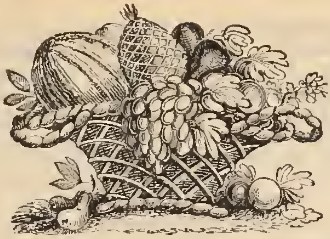
The *Zizania* are among our choicest aquatic plants for decoration, or would be if they were better known. They delight in a soft, muddy soil, and flourish in water five to twenty feet deep. They are best described as a stout, reed-like water-grass, with large, pyramid-shaped, spreading panicles, often two feet in length, growing in deep or shallow water and swampy borders of lakes, rivers, &c.; growing from three to ten feet high, with long, linear, lanceolate, flat leaves, from two to three inches long; ripening the grain in August.

WATERSIDE PLANTING.

BY SYLVESTRIS, IN "THE GARDEN," LONDON, ENG.

NOTHING adds so much to the charms of a landscape, as the presence of a lake or a river, more especially, if their margins be planted with trees and shrubs. Sombre masses of Conifers, the feathery forms of Birches and Willows, and the fiery autumn-coloured masses of American Oaks and Maples, all contribute their share of beauty to such situations. It may be said that dark, impenetrable trees or groups should find no place on south sides, because of the gloomy shadows imparted to the water when so situated. One of the items not to be overlooked in such planting, is the hue which the trees assume in in autumn, a point next to form. Amongst the many American Oaks which become beautiful in autumn, may be named Quercus rubra, Q. Catesbei, Q. ambigua, Q. palustris, Q. coccinea, and Q. tinctoria. These flourish magnificently in moist ground, and, whether associated in groups or placed as solitary trees, yield charming effects, especially, when hanging partly over the water. Platanus occidentalis succeeds well in such places. Quercus pedunculata fastigiata is effective, either in the form of a group or singly: so, also, is Celtis australis, by itself or associated with varieties of Alnus. The Celtis is a good tree to plant where a rocky margin exists. Catalpa syringæfolia succeeds excellently with its roots partly immersed in water, and, when mixed with such subjects as Thuja occidentalis, or Juniperus virginiana, or some dark green Pinus, as a background, to set off its masses of white blooms, the effect is all that could be desired. In good soil it will reach a height of from fifty to sixty feet. Of Poplars, such kinds as Populus alba, P. alba nivea, the different varieties of P. balsamifera, (especially macrophylla and grandidendata) and P. græca, are indispensable. P. pendula should be used with caution, as, if planted in quantity, it seems to impart a sense of sadness to the landscape. The Poplars look best planted in groups with rapid-growing Conifers. The Tulip Tree succeeds admirably in moist situations, and its autumn tint is peculiarly pleasing. With American Oaks it makes a happy combination. There is a pyramidal variety which is useful for lightening up round-headed groups. Juglans regia laciniata is likewise a low-growing, pretty tree, as are, also, the American Ashes, such as Fraxinus juglandifolia, F. aucubæfolia, and F. longifolia, the latter having foliage of a violet colour; F. sambucifolia is a tree with a most distinct character; also F. lentiscifolia. The pendulous kinds of Ash make good waterside trees, and the nearer they are planted to the water the better they look.

NATIVE FRUITS,



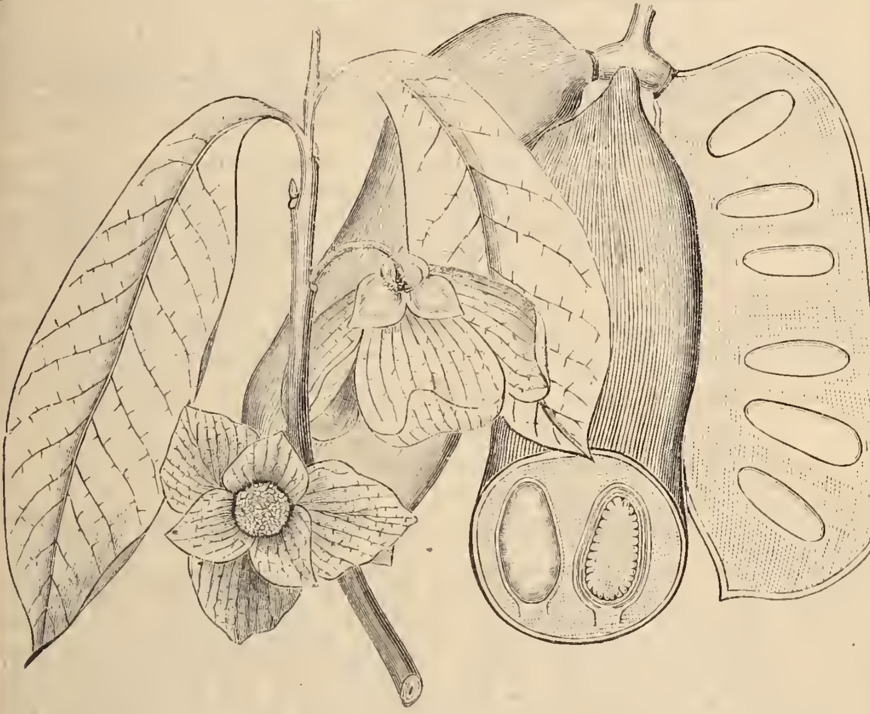


FIG. 111.

ASIMINA TRILOBA. DUNAL.

PAWPAW OR CUSTARD APPLE.

WHO has not heard of the Pawpaw? It is one of the most familiar names for fruit, especially among the people living throughout the entire Ohio and Mississippi Valleys; but, common as it is, we venture the assertion that only a small portion of our readers ever saw a fruit, much less a flower. The name Pawpaw, however, is very indefinite, for there are two entirely distinct kinds of fruit known by this name; the South American Pawpaw —*Carica Papaya*—a most delicious fruit, nominally from Peru, and the North American Pawpaw—*Asimina triloba*—the subject of this article.

The best explanation for its name is given by Prof. Gray, which reads: "The popular name of Pawpaw was doubtless given to the fruit of *Asimina triloba*, from a fancied resemblance to the appearance or taste of the fruit, to the true Pawpaw of tropical America, (the fruit of *Carica Papaya.*) *Asiminier*, from which *Asimina* was formed, is the name by which the fruit was known among the old French Colonists. (*Gray's Genera.*)

Perhaps, it would not be amiss to try and make a point here, by calling the attention of those plant lovers, who are always complaining of hard names, to the necessity of scientific names to distinguish these fruits; for they are known the world over by their local nature names, and still have no relationship, in qualities in common with each other, in the natural order of the vegetable kingdom.

Some of the most interesting fruit of the tropics are produced by the botanical family *Anonaceæ*, and are known by the popular names of Alligator Pear, Custard Apple, Sour Sop, Sweet Sop, &c., many of which are among the most delicious fruits in the world, while a few, although not palatable, present some of the most exquisite forms in the vegetable kingdom. The *Anonaceæ* is exclusively a tropical or subtropical family, with the single exception of the *Asimina*, which, *per contra*, is a peculiarly temperate zone genus; three species of which, are found in the Southern States, (North America,) reaching from about 25° to 35° north latitude, while one species, *A. triloba*, the subject of this paper, reaches to a little above 42° 30′ north latitude, in the central portion of the continent, being recorded as growing at Ann Arbor, Mich.—(Winchell); and in Wisconsin and Minnesota—(Dr. C. C. Parry). The three southern species grow only from about six inches (*A. Pygmæa*) to three feet (*A. grandiflora*) high, and produce a small, worthless fruit; while *A triloba* grows from fifteen to twenty-five feet high, and its fruit, by many, is considered a very desirable one; but, to us, it always tasted like a tropical fruit, grown in an unfriendly climate, and destitute of the rich, luscious flavor we expect to find in them, but, of which they are void. They seem to prefer a cool, rather moist, shady situation, especially in the thickets near the banks of streams.

At the head of this article we give at Fig. 111 a picture of the fruit, flower and leaves of the *A. triloba*, which, disregarding the quality of its fruit, is certainly worthy a notice among our native fruits; especially, as we propose to review the whole series, as time and circumstances will permit. The portion of the bush we have selected for our illustration, is from near the end of a branch, and shows two leaves and two flowers in their natural form and position, but reduced in size. The leaves, as represented in the picture, are oblong, obovate, thin, from eight to twelve inches long, pointed, and covered with a rusty down when young, which, however, soon disappears. The flowers, Fig. 111, *c*, are of a dingy or copper-brown, about 1½ inches wide, nodding, produced from the axils of last year's leaves, and appearing with the leaves in April or May. Stamens numerous, short, and covering the torus with a solid, globular or pyramidal mass. Fruit ovate-oblong in form, smooth, pale greenish yellow, about 3 or 4 inches long, and ripening in October. Fig. 111, *c*, represents a bunch of fruit back of the leaves with one fruit cut horizontally from end to end, to give a horizontal section, showing, also, the seed *insitu*. The seeds are flat, arranged in two horizontal rows, and are enclosed in a fleshy aril. As we said before, the flesh to us is a sweet, insipid, pulpy mass, but, like many other native products, a taste is very readily acquired, so that, perhaps, we should say, "fruit edible, desirable?"

The wood of the *Asimina*, and, indeed, of all the *Anonaceæ*, is soft and yielding, (some species are, however, very elastic) so much so, that one species, at least, is used in the West Indies as a substitute for cork. The leaves, bark and wood of all the family emit a very disagreeable aromatic or fetid odor when bruised, but in some species it is more nauseous than in others. "The Malayans use the bark of several *Anonaceæ* reduced to pulp, for bruises and rheumatic pains, and the fruit of others as a stomachic. With the flowers of *Uvaria odorata*, and with other aromatics and *Curcuma* root, they prepare an ointment with which they annoint themselves to ward off fevers in the rainy season. European women in India, it is said, macerate these scented flowers in cocoanut oil, as a hair oil. The root of *Polyalthia macrophylla* is strongly aromatic, and the Javanese mountaineers use an infusion of it in eruptive fevers; they also use the fruit of *P. Subcordata* to allay nervous colics. *Artabotrys suaveolens* grows in nearly all the islands of the Malay Archipelago; from its infused leaves is prepared an aromatic medicine, which is very efficacious in inducing reaction during the cold stage of cholera. The aromatic fruit of *Xylopia grandiflora* furnishes the Brazilians with a condiment and a stimulating drug; that of *X. frutescens*, a shrub found throughout tropical America, is used as pepper by the negroes; that of *X. longifolia*, which grows on the shores of the Orinoco, is reckoned one of the best substitutes for quinine. *X. æthiopica* furnished the ancients with Ethiopian pepper, before black pepper was introduced from India. * * * The leaves of *Asimina triloba* are used to hasten the ripening of abscesses * * * and its seeds are emetic."—(*Hooker's Descriptive and Analytical Botany.*) "The seed of *Anona squamosa*, according to Royle, contains an acrid principle fatal to insects, on which account the natives of India use them powdered and mixed with the flour of Gram (*Cicer arietinum*) for washing the hair."—(*Treas. of Botany.*)

From the above it will readily be seen that this family of plants contributes a very important element to the health and comfort of man; hence, is of great economic value. As an ornamental tree or shrub the Pawpaw adds a charm to a large lawn from its peculiar aspect, being of dense and pyramid growth, with the leaves always gracefully drooping. Their hardiness to at least 42° north latitude will also add to its desirability for lawn planting; and, although the fruit is not relished by all, it is esteemed by such a large portion of the people, that it is certainly worth cultivating, especially, as it seldom fails to produce a good crop every season. "The southern species, *A. Grandiflora*, produce a large, white, cap-shaped bloom, stained pink near the stem, with a sweet, insipid fruit, two or three inches in length and one inch in diameter, edible to some when ripe. *A Pygmæa*, a very common bush in Florida, growing in clumps, leaves drooping to the ground, flowering in April and May, in two rows along the underside of the limb, of a variegated white, red and purple color, very ornamental."—(*M. Coleman.*)

CLIPPINGS.

Mr. George Dines, who has had extensive experiments and observations on the formation of dew, finds that the depth of deposit in England, in an evening, rarely exceeds an one hundreth part of an inch; and that the average annual depth of the dew, upon the surface of the earth, does not exceed an inch and a half.—*Scientific American.*

In propagating *Coleus Chameleon*, it is best to use only the bright colored shoots, and to use a little wood-ashes in the potting soil. Cuttings struck in the Fall keep their color better, and make finer plants than those propagated at any other time; but they should be kept warm enough to keep them constantly growing.—*H. W. Hales, Ridgewood, N. J., in Gardeners' Monthly.*

Crooked young trees can be greatly improved, if not entirely straightened, by repeated longitudinal incisions, on the inner side of the bend, during growing season. Such treatment will increase the formation of wood in that side, and tend to straighten the tree.—*Nebraska Farmer.*

GATHERING AND SHIPPING FRUIT.

THE demand for fresh fruit in all our cities and towns has increased to such an extent, that fruit growing is now recognized as one of the most remunerative industries of the country. It is not every one, however, that succeeds as a fruit grower; at least, this is the inference arrived at, if we are to judge from the comparatively small number of successful growers; but, on the contrary, the successful one seems to be the exception, while the unsuccessful one, or only indifferently successful one, is the rule. A great variety of causes must be assigned as the reason, some of which are beyond human agency to control; while others are usually the immediate effect of inexperience or neglect. Again, all portions of the country are not equally well adapted to fruit culture, for horticulturists generally recognize the fact that there are numerous well defined fruit centers, each one adapted to some special kind of fruit. Still, all portions of the country, will, with proper care and cultivation, produce a reasonable return in fruit for the labor bestowed upon it.

We have, north of the 37° 30′ north latitude in America, three distinct localities especially adapted to Peach culture; viz: The states of New Jersey and Delaware in the East; the Western shore of Michigan, from near the 42° to the 43° north latitude, in the North-West; and the Southern portion of the State of Illinois, in the great Mississippi Valley Basin. The Eastern Peach belt is only about one hundred miles long by thirty miles wide, and yet it furnishes the great majority of Peaches for the New York, Boston, Philadelphia and Baltimore markets, as well as a large proportion of this fruit in all the smaller cities and towns of the North and West, nearly to the Rocky Mountains.

It would be almost impossible to obtain any thing like a definite estimate of the quantity of fruit produced at all the great fruit centers, particularly, as some of the fruit growers are inclined to guard their interest with a jealous care, and often suspect all inquiries regarding their crops to be of a personal nature—perhaps, conflicting with their interests. We have secured, however,—thanks to our horticultural friends—a very fair estimate of the fruit products, either in the amount shipped or the quantity of land employed in growing the crops, so that a very good idea can be gathered of the magnitude of the business, by the following figures.

In addition to the figures taken from the Custom House books at Benton Harbor, Mich., must be added about 10 per cent., as the amount shipped by Railroad, (including Express.)

STATISTICS OF PEACHES, BERRIES, AND MISCELLANEOUS FRUITS, SHIPPED BY DELAWARE DIVISION OF PHILADELPHIA, WILMINGTON AND BALTIMORE R. R. [OFFICIAL.]

	1875	1876	1877	1878
Berries in Quarts	7,712,256	7,882,912	604,712	6,993,312
Peaches in 5/8 Bush. Baskets	4,330,036	1,144,931	2,133,790	463,173
Cherries in Quarts	116,384	153,120	....	....
Apples and Pears in Barrels	6,211	6,883	6,318	1,581
Apples, Pears and other Fruits, in other packages, in Bushels	41,945	17,386	17,810	34,416

APPROXIMATE AMOUNT OF FRUIT SHIPPED FROM THE ST. JOSEPH (MICH.) FRUIT BELT, 1878.

	Berries in ½ Bushel Packages.	Peaches and Grapes in ⅓ Bush. Pkges.	Apples in Barrels.	Miscellaneous Articles in Boxes.
Via C. & W. M. R. R.	63,438	75,984	53,428	2,993
Via Steamboats	95,857	113,976	80,142	4,489
Total	159,295	189,960	133,570	7,482

AMOUNT OF FRUIT AND VEGETABLES SHIPPED FROM SOUTHERN ILLINOIS FRUIT BELT, 1878. [OFFICIAL.]

	From Cobden.	From Anna Station.	From Alta Pass.	From Villa Ridge.
Via Express	672,550 lbs.	76,850 lbs.	84,040 lbs.	42,000 lbs.
Via Fruit Train	7,804,227 lbs.	1,486,483 lbs.	36,829 lbs.	1,364,780 lbs.
Total	8,476,777 lbs.	1,563,333 lbs.	120,869 lbs.	1,406,780 lbs.

SANDUSKY, OHIO, GRAPE PRODUCT, 1877. [OFFICIAL.]

[This Belt comprises Erie and Ottawa Counties, principally; Kelly Island is in Erie County, but all the other Islands, viz. Put-in-Bay, North, South and Middle Bass, Catawba Islands, &c., are in Ottawa Co.]

	Number of Acres in Vineyard.	Pounds of Grapes produced.	Gallons of Wine made.
Erie County, Ohio	1,374	2,059,648	233,676
Ottawa County, Ohio	1,862	3,004,904	183,475
Total	3.236	5,064,552	417,151

STATEMENT OF FRUIT SHIPED FROM BENTON HARBOR, MICH., 1878, VIA LAKE. [FROM THE CUSTOM HOUSE BOOKS.]

Apples in Barrels	57,616	Peaches, ¼ Bushel Baskets	26,283
Strawberries in Crates (32 qts.)	32,348	Pears, ¼ Bushel Baskets	2,229
Cherries in Crates (32 qts.)	2,973	Quinces, ¼ Bushel Baskets	230
Raspberries in Crates (32 qts.)	10,866	Grapes, ¼ Bushel Baskets	12,648
Blackberries in Crates (32 qts.)	16,473		

The year 1878 is known among fruit growers as an "*off year*," which is best understood by saying "a year of a bountiful crop is usually followed by one of a small yield, which may be explained by the well known fact that fruit trees become so far exhausted by a heavy crop that it requires two years to renew its lost vigor. A good comparison is furnished by the following figures of fruit and vegetables shipped from Anna Station, Ill.: In 1877, 2,427,690 pounds; in 1878, 1,579,610 pounds.

The figures from Southern Illinois are, however, rather incomplete, because the figures of shipments, as furnished by Railway and Express companies, are the sum total of both fruit and vegetables, which could not be separated. From another source we learn that from the commencement of the season up to June 1st, 1878, there were shipped from Cobden, Ill., 45,500 crates of strawberries, of 24 quarts each, equaling 69,200 quarts, or 776 tons of fruit; and during the season (1878,) from the same locality was shipped 100,000 boxes, holding a third of a bushels of tomatoes.

In regard to the amount of land employed as orchards, we learn that Cobden has in its immediate vicinity 4,960 acres, viz.: 1,200 in strawberries, 1,400 in peaches, 1,500 in apples and 860 in miscellaneous fruit. But it is the efforts of the single individuals that makes up this wonderful sum total. Let us see a few figures lately clipped from the *American Agriculturist*. It says: "A. H. Carey, of Wyoming Station, Del., has 400 acres in orchards, including 15 in pears, 75 in peaches, 30 in blackberries, 12 in raspberries and 10 in strawberries. J. G. Brown, same place, has 400 acres in orchards, including 200 in peaches, and 50 in raspberries. James A. Ross, Bridgeport, Del., has 1,200 acres in orchards, including 40 in pears, 350 in peaches, 75 in peaches, 75 in raspberries, 25 in strawberries. From another source we learn that Robert McKinstry, of Hudson N. Y., has on his fruit farm has 24,000 apple trees, 1,700 pears, 200 plums, 500 peach trees, 4,000 cherry trees, 200 crab apples, 1,500 vines, 6,000 currants." We might continue these lists to an indefinite length, but enough has been given to convey an idea of the enormity of the business, even in America.

Now, let us see what we can learn from our English cousins about their fruit for market. In a recent number of *The Garden* we find: "From Kent comes the chief supplies of small fruit for preserving, and the quantities of these sent annually to London and other large towns are enormous. People, indeed, unacquainted with fruit culture on a large scale, can form no conception of the vast plantations of orchards and bush fruit that are to be found in Kent. About Swanly and its neighborhood, from any hill-top, may be seen miles of the higher-lying ground crowned with Gooseberries, Currants and Raspberries. * * * * Some growers, in good seasons, have been known to gather more than 3,000 bushels of Gooseberries. * * * * * * Raspberry picking is performed by women and children, each of whome carries two baskets, of the form of a flower-pot, one in front and one behind, slung over the shoulders; these, when full, are emptied by boys into wooden tubs, provided for the purpose—that is, if the fruit is intended for preserving; but, if for Covent Garden, baskets are used. Few Raspberries, however, come to Covent Garden, compared with what go direct to fruit preserving depots. * * * Many single growers contract with manufacturers to supply them with ten tons each. Few of the Kentish Raspberries are picked with stalks attached to them; most of the fruit seen in Covent Garden furnished with stalks, is supplied by growers near London, who pick their finest fruit for that purpose, and put them at once in small punnets lined with leaves, which are then packed in quantities, in layers one over the other, into large, square, wooden boxes, or chests made expressly for the purpose."

Good, wholesome fruit is one of the greatest luxuries within reach of any people; in fact, it is almost an indispensable necessity to good health, because the human system naturally craves it; while stale fruit is exactly the reverse, and, really, is more injurious to the system than all the benefits arising from the use of good, fresh fruit; but, if people cannot get it fresh and healthy, they will obtain stale fruit as a substitute. What we usually call ripe fruit, is, in reality, only the first step in decomposition; and, when fruit is shipped in bulk without due regard to ventilation, it heats and ferments, or sours, and is then almost a deadly poison to the human system.

Now, the price of fruit, as well as every other product, is governed, very materially, by its quality; and fruit growers who uniformly deliver large, clean and sound fruit, strictly adhering to a fixed determination to maintain a high standard of excellence for it, will, as a matter of course, secure the best class of custom. It is a well known fact, that too many of our fruit growers cannot resist the temptation of putting in just a few inferior or unsound berries, or a few knotty, wormy or windfallen apples, pears, peaches, &c., to fill up a certain desired quantity, which might otherwise have been quite choice; but, dealers soon learn that a very few defective specimens, in an otherwise choice basket, will lower the grade of the whole lot, and, in his second purchase, the merchant will seek a new grower for his supply. This is a very important question to fruit growers, which they cannot afford to shut their eyes to in these days of strong competition.

In the last number of the INDEX, (April, 1879,) page 36, Fig. 101, we gave a cut of a fruit protector, which is a step in the right direction; for it is an absolute necessity to keep the fruit clean to make it marketable—not by washing it, for wetting fruit usually spoils it for market, but by keeping it clean all the time it is growing.

The purpose of this article, however, was not "how to grow fruit," but, "how to gather it and place it before the people ready for the table," and, in a good marketable condition. And right here, we wish to acknowledge the favors from our many horticultural friends, for the use of cuts to illustrate this article, which will enable us to give a better idea of the subject than words will do.

The usual mode of gathering all kinds of fruit is by *hand picking*, which is slow and tedious, with most kinds of berries, at least; but, a few mechanical Fruit and Berry Pickers are now offered for sale, which are of permanent value. Fig. 112 is a Fruit Gatherer, owned by William Pickett & Son, Chicago, Ill., and presents many advantages of great value, for gathering large fruit, particularly, as it gathers the fruit without bruising or injuring it in the least. Its length enables a person to select a good position, and, without changing it, to gather from a large portion of the tree, thereby saving a vast amount of time by not having to continually change positions, as well as by retaining the fruit in the adjoining sack until a quantity is gathered. Fig. 113 is a Berry Picker, owned by L. B. Silver, Cleveland, Ohio, and consists of a neat little India-rubber cup, artistically fitting the hand, holding about a half pint, and obviating the liability of squeezing or in any way injuring the fruit while picking. Fig. 114 is a peculiarly constructed Grape Cutter, owned by A. A. Weeks, 82 John Street, New York City, and is the most complete article, not only for cutting off the bunches of grapes without injuring the fruit, but, also, for cutting flowers, especially, roses, etc. These illustrations are all so plain that the eye, at a glance, comprehends the working of these three articles.

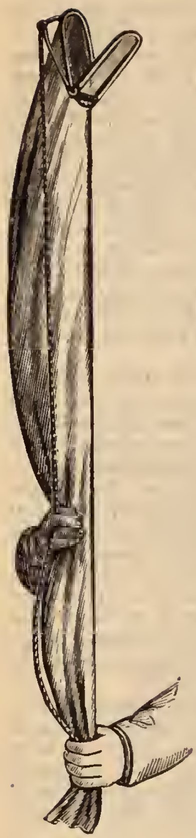


FIG. 112.

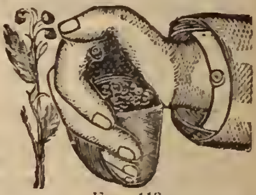


FIG. 113.

So much for inventions to assist in gathering fruit; but, here, the care and anxiety about fruit growing only just begins, for no matter how choice and fine the fruit may be when freshly gathered, it must be taken to our large cities and towns to find buyers, and how to get it there is the most important question. The old mode of shipping was in boxes, more or less systematically made but all objectionable from lack of a known standard of size for large fruit, while small fruit usually fermented before the dealer could possibly dispose of them. The Standard boxes, however, $\frac{2}{3}$ bushel (Fig. 115) and the bushel box, (Fig. 116) were soon adopted and still continue the favorite for shipping all kinds of such coarse and heavy fruit and vegetables as Apples, Pears, Tomatoes, Sweet Potatoes, &c., but are usually abandoned for Peaches, Plums, Cherries, Grapes, &c., which are now more extensively shipped in baskets that hold about one peck. Several patterns are in use in different portions of the country, each fruit center, apparently, adopting its own favorite form or make of baskets. They are expected to hold a peck of fruit, but it requires the fruit to be rounded up to make a peck, which

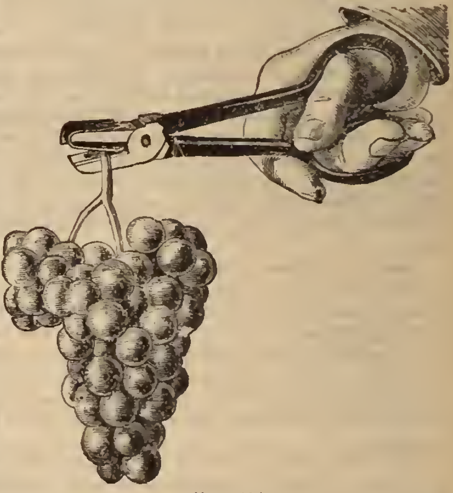


FIG. 114.

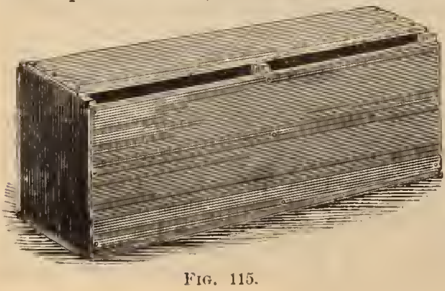


FIG. 115.

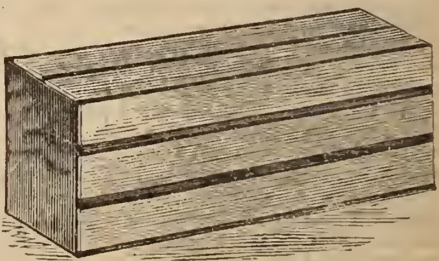


FIG. 116.

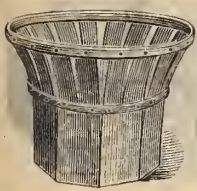


Fig. 117.

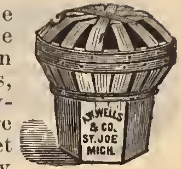


Fig. 118.

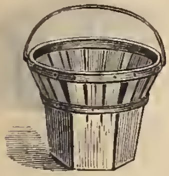


Fig. 119.

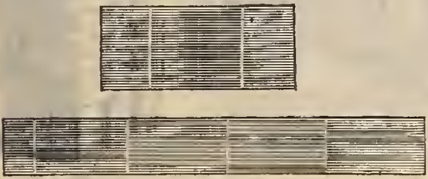


Fig. 120. *Hallock's Patent Qt. Box, in flat, band and bottom.*

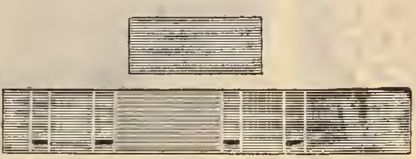


Fig. 1.20 *Leslie's Patent Qt. Box, in flat, band and bottom.*

is seldom done, consequently, they usually hold only one-fifth of a bushel. Fig. 117 shows the Michigan Fruit Basket, as manufactured by the Union Bag and Paper Co., of 53 & 55 Michigan Avenue, Chicago, Ill., which, for many years, was the form adopted by the Michigan fruit growers. The baskets, when filled with fruit, were always covered with a piece of tarleton, millinet or mosquito bar, of various colors, principally green or some of the shades of red; the brightest scarlet, however, gives the fruit a much richer appearance than any other color. Fig. 118 shows an improvement adopted by A. W. Wells & Co., of St. Joseph, Mich., on the old form of open baskets. It is the so-called Rail Road Cover, made of the same material as the basket, and fitting it nicely, and which, when securely fastened by wire or strong cord, facilitates the handling and storing. To meet the further demand for a convenient basket, A. W. Wells & Co. have added a wire handle sixteen inches long, hooked at each end through the rim of the basket. (Fig. 119). This enables the purchaser to carry it with ease, which is always an inducement to take something home as a pleasant surprise. The dealer usually refunds a small sum of money for the return of the basket, which he returns to the fruit grower in nests similar to Figs. 129 and 131. For small fruit the bushel drawer is very extensively used, especially, around Cincinnati, for each locality has its own particular pattern. The drawers are two inches deep, and carry Plums, Cherries, &c., very satisfactorily, and, as they can be packed in a frame together, they are well ventilated, are easily handled and occupy only a small space, which is a very important item to shippers. We must say, however, these drawers are very unsatisfactory to retail dealers and buyers of choice, soft fruit, such as Strawberries, Raspberries, Blackberries, &c., as the berries usually present a bruised appearance when prepared for the table, caused, in a great measure, by the extra handling or difficulty of getting them from the drawers. The most satisfactory mode of shipping small fruit is in small baskets and boxes, usually holding one quart; however, some hold only a pint. Several patterns are now in use —all good—and it would be almost impossible to praise one more than another. Figs. 121 and 123 represent two patterns of quart boxes, manufactured by the Box and Basket Co., of Cairo, Ill. These boxes are made of one-fifth inch lumber, and are prepared, at their factory, for folding together and fastening by the fruit grower; and, while in the unfinished condition, shown at Figs. 120 and 122, they occupy so small a space that it costs only a trifle to ship them by express to all parts of the country. Berries carry with perfect safety in these boxes, and are presented to the consignee in excellent condition. Another new and very practical berry box and fruit basket (Fig. 124) is made by the Union Bag & Paper Co., Chicago, Ill., and is made of water-proof

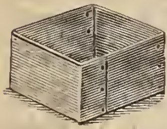


Fig. 121. *Hallock's Qt. Box.*

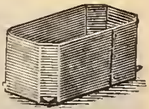


Fig. 123.

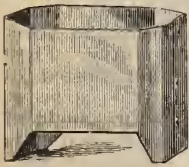


Fig. 124.

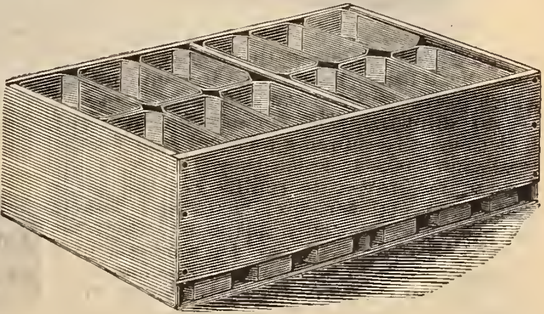


Fig. 125.

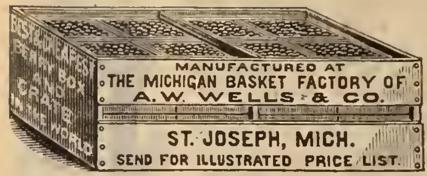

MANUFACTURED AT
THE MICHIGAN BASKET FACTORY OF
A.W. WELLS & CO.
ST. JOSEPH, MICH.
SEND FOR ILLUSTRATED PRICE LIST.

Fig. 126.

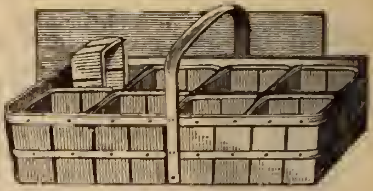


Fig. 127.

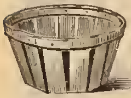


Fig. 128. *The Star Basket.*

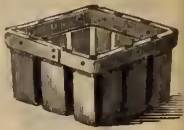


Fig. 130. *Delaware Qt Basket.*

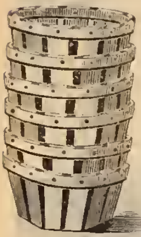


Fig. 129.

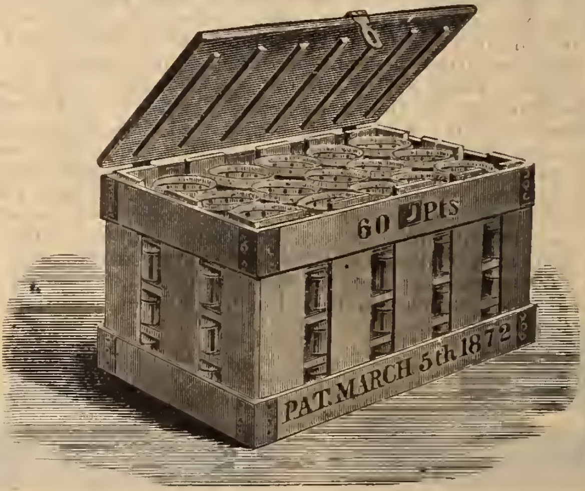


Fig. 132.

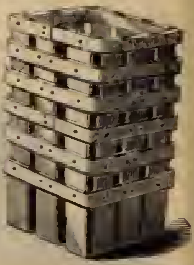


Fig. 131.

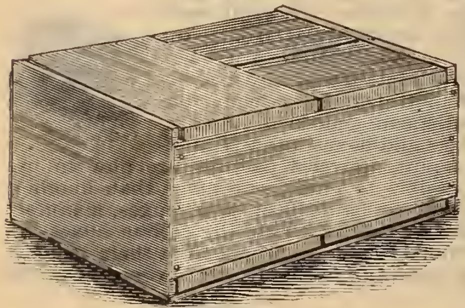


Fig. 133.

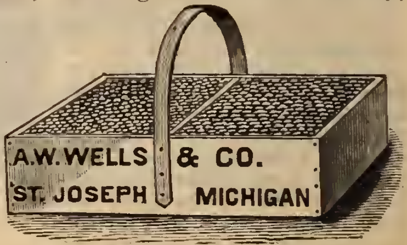


Fig. 134.

straw board. They are cut and scored at the factory, ready to be tacked together at the fruit grower's home. Many advantages are claimed for these over the wooden boxes, but, as they are comparatively new to shippers, the points of superiority are not yet fully attested. For shipping to market, some fruit growers use a very ordinary box, as a crate, similar to Fig. 125. If it is advisable to give the berries more air, such a box as Fig. 126 is often made. These are very cheaply constructed, and the cost is small. They serve their purpose for a short journey very well. Fig. 127 represents a basket made by I. C. Wood & Brother, Fishkill, N. Y., which is the favorite with many shippers, notably, E. P. Roe, Cornwall-on-Hudson, N. Y. Perhaps, one of the most satisfactory collection of shippers supplies are those made by William Parry, Cinnaminson, N. J., himself, one of the heaviest fruit shippers in the country. Figs, 129 and 131 represent baskets nested together to return to the fruit grower. Probably, the most satisfactory mode of shipping, is in some of the patent frames or crates similar to Fig. 132, which is made by William Parry, of Cinnaminson, N. J., fastening with a lock and key, which prevents the petty pilfering, so annoying to shippers. The commission men and dealers usually refund a nominal sum for the boxes and baskets, which they return in the crate to the grower, to refill. For the grape trade, a special series of boxes and baskets are prepared, especially adapted to their requirements, for, as grapes are enclosed in a tough, dry skin, ventilation to prevent heating while in transit, that most small fruit requires in a measure, is unnecessary; hence, the urgency does not exist for the great care

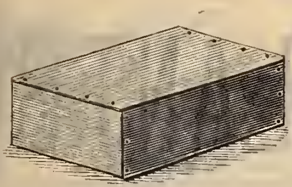


Fig. 135.

and precaution so necessary for other fruit. Fig. 134 represents the ordinary handled grape box, manufactured by A. W. Wells & Co., St. Joseph, Michigan, which is very extensively used. Fig. 135 represents the the six-pound grape box, and Fig. 133 the twenty-four-pound grape shipping crate, made by the Cairo Box and Basket Co., of Cairo, Ill. Of course, all these articles are made by other firms than those mentioned above, but, as they have been long in the business, their patterns and patents are recognized as of great value by all extensive shippers and growers, and as they always keep on hand a full line of Fruit Shippers' Supplies of all kinds, we would recommend any one in need of their goods to correspond directly with them before ordering elsewhere. We would also respectfully call attention to the "Horticultural Directory" published in each number of the Index, as it contains a variety of business cards pertaining to floriculture and horticulture.

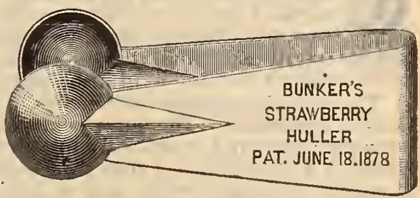


Fig. 136.

In the next number of the Index we propose to give a short sketch of the progress made each year in preparing fruit for the table,—both fresh, dried and preserved—and shall be pleased to receive notes and estimates from manufacturers, as well as descriptions from inventors of the articles now in use for labor saving in this particular branch of industry; for it is very essential to have fresh fruit taken care of without any delay, in order to successfully compete with each other in the same business. With this explanation our friends in the business, as above stated, may expect to be troubled with questions which we hope will be cheerfully answered. Our limited space will not allow of a satisfactory description of any of the new inventions, but we have had so much real pleasure in using Bunker's Strawberry Huller, (Fig. 136) manufactured by A. S. Bunker, Lawrence, Mass., that we must notice it now, even if the season is so advanced that they will not be very useful this season. We have tried it to our own satisfaction and have no hesitancy in saying it must be a success, but cannot so well describe its value and working as by quoting from the American Agriculturist, which says: "Where strawberries grow with a distinct neck the operation of hulling is easy, and no aid is required to the fingers of the operator. But many varieties, especially those that produce very large berries, have the hull (or more properly speaking, *calyx*,) so closely attached to the fruit, that it is troublesome to remove it by the use of the finger and thumb, and when, as is often the case with the large berries, they grow in the "cockscomb" shape, the calyx is so malformed, and partly covered by the shoulders of the fruit, that it is impossible to remove it neatly without using a knife. It consists of a pair of forceps, or tweezers, of the form shown in the engravings; they are apparently of brass, and silver-plated. Like most useful affairs, it is very simple, and its peculiar form allows it not only to save the fingers where the hulls present no especial difficulty, but with troublesome and coxcomed berries, it allows the calyx to be cut out neatly and quickly and leave the berries in a presentable condition." Mr. Bunker has very kindly sent us his cuts to illustrate this article; one, Fig. 136, showing the huller, while Fig. 137 represents the article in use. They are so very cheap, (ten cents each or ninety cents per dozen,) that we hope to see a good supply in every family, and know they will find plenty of use.

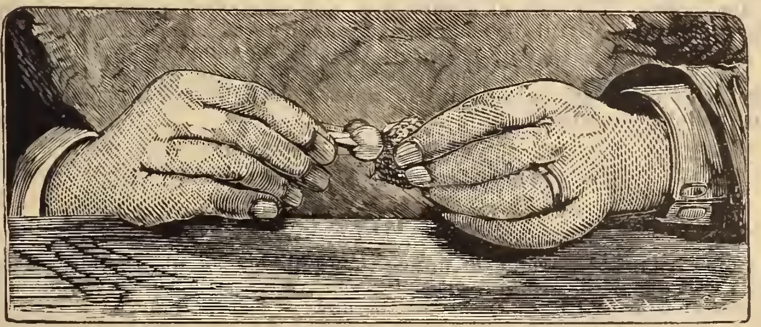


Fig. 137.

B. CASE
RICHMOND
IND
FROM
J.V. & S.
LONDON
CASE
IND. RICHMOND

NEW & RARE PLANTS

[We would request any one having new or strange Plants, to send us a notice for publication in these columns.]

NEW AZALEAS.

NEW DOUBLE FLOWERED INDIAN AZALEA, EMPRESS OF INDIA. A. Van Geert.

THIS splendid new double flowered Indian Azalea may be considered as the finest variety sent out of late. Its sterling merits do not only reside in the decided beauty of its colour and the correct shape of its flowers, but in its fine, dark foliage and nice, compact growth as well. No other variety buds more freely than it does, and it will certainly make a first class plant, both for market and exhibition purposes.

The flowers measure four inches in diameter, and may become larger still under skillful treatment. The outer petals are elegantly undulated and slightly recurved outwards, showing beautifully forward the numerous central petals. The ground colour is a warm salmon rosy tint, nicely enhanced by a pure white ribbon, running along the undulated outer part of every petal. A blotch of carmine spots radiates from the center of the flower towards the upper petal. We think there is no exaggeration in terming the sight of a well flowered plant as truly grand.

At the International Show held at Ghent, in April, 1878, where this fine Azalea was exhibited for the first time, it obtained the first prize, under the provisional name of "*Heros des Flaundres*; and all our continental growers were unanimous to confirm the decision of the Jury. Since then, at the meeting of the Floral Committee of the Royal Horticultural Society, held on the 11th of March last, it obtained the highest award it could get, viz: A first class certificate.

These two judgements confirming our own opinion respecting the merits and excellence of the plant, we have thought ourselves authorized to dedicate it to the Most Gracious Sovereign of its original home, THE EMPRESS OF INDIA.

NEW WHITE DOUBLE FLOWERED INDIAN AZALEA, LOUISA PYNAERT. A. Van Geert.

THIS new, grand Azalea is the largest and the best shaped white, double flowered variety extant until now. It is unsurpassed in size, the diameter of its flowers being quite five inches. They are of a very firm and consistent texture, and, therefore, will be exceedingly useful for bouquets and other floral purposes. As an exhibition plant it will make an astonishing feature through the immense size of its flowers.

It originates from one of the most successful Ghent grower, the late Mr. L. Brugge, who has raised a good many of the best varieties now in commerce.

Ghent, Belgium, April 1, 1879. A. VAN GEERT.

ANEMONE NEMOROSA. FL. PL.

A NEW DOUBLE ANEMONE.

A young botanist—a friend of mine—found in one of his rambles through the forest, a year ago, a native *Anemone* (*Anemone Nemorosa*) with very double flowers. He was so charmed with the beauty of the flowers that he removed the roots to the flower garden, and this season the plants have grown and bloomed handsomely—as large and double as a Daisy—i. e., as large as a nickel, and pure white. The plants seem to thrive under cultivation. I was surprised to find the flowers remain so long in bloom; several single flowers often lasting *several weeks* on the plants. I believe flowers of this, and of the native wind-flower, are occasionally met with, having semi-double flowers, but I have never seen or heard of one so double and large as this one. It is to be hoped that this may be the beginning of great improvements in our native species, until they shall vie in variety and beauty with the foreign sorts. Even the single variety is a very handsome plant in its native forest home.

Dunreith, Ind., May 1879. E. Y. T.

CORRESPONDENCE

[We solicit the privilege of publishing extracts from correspondence, of interest to the general reader. Correspondence upon Botanical subjects respectfully solicited.]

HAARLEM, HOLLAND, April 26, 1879.

MR. L. B. CASE.—*Dear Sir:* I beg leave to inform you that the April number of the BOTANICAL INDEX, and your kind letter, came safely to hand. * * * * The illustrations you have got from Mr. Vick are very good, indeed. They give a good idea how bulbs are treated.

As soon as I can tell you with certainty about the Fall crop of the bulbs, I shall do so, and hope it may be in time; but it depends on the weather. I can tell you now that Hyacinths will not be cheap, for the prices of our Spring auctions are very high. The stock of some growers has suffered badly, so they want to restore it, and buy bulbs dear for cultivation; but withhold them at the same time from the market. With best regards, I remain, dear sir, yours respectfully,

C. E. VAN GOOR.

HAARLEM, HOLLAND, May 18, 1879.

MR. L. B. CASE.—*Dear Sir:* I beg leave to inform you that I have sent to your address my Calalogue for Dutch Bulbs and Flower Roots, for 1879, which I hope will come safely to hand.

I am pleased to say that Hyacinths will be a great deal better than last year. They look strong, and only want some warm days, to get right. The prices of the leading sorts and mixtures are a little higher than last year, because, in our Spring auctions higher prices were paid, in order to secure more stock, and, also, because the general stock has suffered badly for the last two years. It is my idea that Hyacinths will be good in quality but not abundant. Tulips will be very good, and there is a good stock; so my prices for that article are low, to which, I take the liberty to call your special attention. All other kinds of bulbs, of which something could be said, look well, so that I expect there will be quite enough for the market, except *Convallaria Majalis* (Lily of the Valley) *Clumps*, whereof, the early *good* ones will be scarce.

I hope these few communications may be useful for your BOTANICAL INDEX. Receive, dear sir, for the second time, my sincere thanks, &c., and believe me,

Yours, very truly, C. E. VAN GOOR.

HAARLEM, HOLLAND, May 21, 1879.

L. B. CASE, ESQ.—*Dear Sir:* Your estimable favor of April 3d, came duly to hand. * * * * I take this occasion to hand you my new list for this season, and take the liberty to recommend it to your special attention. I trust you will find that my prices can rival with those of other trustworthy houses. My stock of Tulips being very extensive, my prices are especially low. Perhaps, it may be of some interest to the readers of your BOTANICAL INDEX, to know that bulbs promise to be extraordinarily bountiful this season; and, that Hyacinths have quite recovered from the disease, and the crop will exceed any of the last five years.

I remain, dear sir, yours, truly, J. J. VAN LOGHEM.

WINNEBAGO, WISCONSIN, May 10, 1879.

L. B. CASE, ESQ.—*Dear Sir:* I notice in your BOTANICAL INDEX for July 1878, an article on the "*Nelumbium Lutea.*" You request information in regard to localities found in addition to those you name. It grows here in abundance, in at least three localities near Oshkosh, (44° north latitude.) I have gathered the flowers every year, for six years, from a small bay in Lake Winnebago, about four miles north of Oshkosh City, and on the Hospital farm. There is, also, an abundance of *Nymphæa tuberosa.* I have been told that the Indians, years ago, gathered the tubers of the *Nelumbium lutea*, and also the seeds, in quantities.

Yours, &c., M. F. BUTLER.

P. S. Did you ever hear of this locality growing the *Nelumbium?* M. F. B.

PRATTEVILLE, CAL., May 20, 1879.

MR. L. B. CASE.—*Sir:* Arriving home, a few days since, from a short trip in Indian Valley, I found your kind letter awaiting me. I hasten to answer your questions in regard to the *Sagittarias.* There are several kinds of them growing in the swamps here, but all the specimens I have noted *have fibrous roots.* I will look more carefully after them this season, and report to you. The water has been so high here this Spring, that I have been unable to get out to where *Nuphar polysepalum* grows. They are already in bloom, and I do not know that it would do to send them now. I planted the seed which you sent me, in the swamp, and they are growing nicely. * * * * With many kind wishes, I remain,

MRS. R. M. A.

WILLIS, TEXAS, June 9, 1879.

MR. L. B. CASE.—*Dear Sir:* In your BOTANICAL INDEX of July, 1878, I note your remarks on the *Nelumbium.* You solicit correspondence &c., that more may be developed as to the nature &c. of this beautiful plant. In response to your invitation, I write, not to enlighten others, but, if possible, to so place myself in communication with those who are informed, that I may learn. It was my privilege last July to come unexpectedly upon a pond containing this plant. I had known it in my childhood in another portion of our State, but had never heard it mentioned here as being among the growth of our water plants. At the time this pond was first seen, the Lily was in full bloom. The portion of the lake containing the plants was absolutely covered with the rich green of the magnificent leaves, towering above which was the bloom, in every stage of development, presenting one of the most beautiful pictures I ever beheld. In November I again visited the pond, and secured quite a quantity of the seed; these I placed in the ground under water, and in water alone in bottles, in our early Spring, now, some three and one-half months ago; so far as may yet be observed, no impression has been made on the germ, and the seeds seem as hard and horny as when placed there. Other of the seed I cut the horny covering from, and these sprang up immediately; and from these I now have some beautiful young plants. How long will it take these plants to reach blooming maturity? If there should be any information that I could give by observation here, I will cheerfully supply it. * * * Very respectfully, &c.,

WILLIS FULLINIVIDER.

NEW ORLEANS, LA., February 25, 1879.

MR. L. B. CASE.—*Sir:* Your kind answer to my last has been on hand some time waiting attention. I had hoped that ere this, one of my roses would have reached you; but I am sorry to say that I was unfortunate enough to break the root of the plant I had so carefully saved for you. * * * *

We have had a fearful summer, but "no sickness came near our dwelling." * * * * We all prayed for frost, long before frost time. At length it came, and so furiously did it come down upon us, that we thought we had almost too severe a winter for this south land. Such freezing weather is uncommon here. For days, our ever-green landscapes were transformed with scenes of white, rime, sparkling ice. Our grass was like snow fields, and our trees, bending under the weight of clearly frozen rain, took strange and fantastic forms of icy beauty. Our evergreens looked like frozen fountains—stiff, white and cold, shining in the sun. Our sunlight never leaves us more than two days in the shade; so for two days, those who like such weather, enjoyed it; but the third day our boreal scene dissolved away, and I, for one, was glad. The Spring is fairly upon us. My little flower garden is bursting into fresh leaf, and I do think the long, cold winter has been of benefit to us in more ways than the killing off of yellow fever, as it has given our deciduous plants a good long rest. I expect splendid roses this year. The cold played havoc with my succulent plants in my little greenhouse, and I have grieved over the dozens of pots containing my lifeless pets which I have nursed and cared for so long. My vegetable garden is coming on; all sorts of seeds already planted, and peas six inches high. * * * * Respectfully, M. B. B.

N. B. Apropos of the yellow fever, we are all fearful of another visitation. If it comes, we will be ruined; for, as a State, we are bad enough off without this terrible scourge. M. B. B.

MORRIS, ILL., May 3, 1879.

MR. CASE.—*Sir:* Perhaps you would like to know how your former customer succeeds with her plants here in Illinois. My window is just a beauty, and a great comfort to me. Although I have many cares, I am never tired of caring for my plants. They are a refreshing rest. They do so nicely. I can't tell you all the varieties which have given me their bright blossoms all the winter; we have never been without several. King frost never got hold of one leaf, and I have scarcely seen a bug. My window has glass doors between it and my sitting-room, so I have no dust or dry air. My *Achænia* has taken the lead; it blossomed all Summer; I then removed it to my window, where it has had from three to ten blossoms every day this past Winter, and has several to-day. My Calla is next; it opened its first flower on New Year's day, and has bloomed nearly every month since, and it now has its fourth bud. I set the vase in a dish, half its height and two inches larger across, which I filled with coarse gravel and water, putting a few small, clean stones on the top of the vase. It keeps so clean and sweet, and does so nicely, that I wish some of your customers who cannot make their Callas bloom, would try it. I put it in my flower-garden, in summer, to rest. I cannot have much success with the Fancy Begonias. I have a large *Rex* which has blossomed twice; also, *Saundersi* and *Weltoniensis.* * * * Many thanks for your past favors. Yours,

C. T. H.

Chinese Sand Pear.

THOMASVILLE, GA., April 17, 1879.

MR. L. B. CASE.—*Dear Sir:* Your letter received to-day, and contents noticed. This Pear was sent to Liberty Co., Ga., about twenty-three or twenty-five years ago, by Maj. John LeComte, who resided, at that time, either in New York or Philadelphia during Summers, and spent his Winters with Mrs. H., his neice, in Liberty Co., Ga. Mrs. H. says that this tree was set out with other trees, and her attention was called to this one as being a foreign tree, and that it would not ripen the fruit in the northern states. This tree grew so rapidly that it soon claimed the attention of all; and a Mr. Barnadoe, a neighbor, took some cuttings from the tree and set them out on his own place near by, and one out of three grew. At this time the old tree began to give her annual installments of good, large, fine pears. This kind of fruit being rather new for that part of the country, (this was right on the sea coast) it created much excitement, and, of course, all were willing to give the tree a trial, and it was found to succeed well on all good dry soil. How this Pear first got the name of China Sand Pear, I am not able to tell; or where Maj. LeComte got this tree, no one living knows. In 1876, in September, the Thomas County Horticultural Society named this Pear after Maj. LeComte, after trying where to find more of its history and failing. This tree grows from cuttings or slips, cut off about fifteen inches long, and stuck in the ground like quinces, &c. It also grows well from grafting or budding; I had a number of them to grow ten feet high, in one season, and one inch through. This Pear tree comes into bearing, usually, in four or five years from cuttings; sometimes, in three. The habit of the tree is to grow very tall, and looks very much, at a distance, like the Lombardy Poplar. The leaves are a very deep green, glossy, and look as if they were burnished. This tree has never shown any signs of decay of any kind. It is first to take on foliage and last to drop it off in the Fall; and in this section, it always gives two crops of fruit the same year. We consider the fruit very good, indeed, and we obtain good prices for it in Boston and New York markets. I can see but little difference between this and the Bartlett, raised in this section, and I think it much better than the Duches, Louis B. D. Y., and many others of the leading varieties. This fruit is not very large; it will average eight ounces. It is very smooth, no blemishes, has a little blush on the sun-side, and ripens here about the 20th of July. My oldest trees are eight years old this Spring; last season they gave me about five bushels, to the tree, of good marketable fruit, which I sold from $3.50 to $5.50.

I have given you about all the information I can, and hope this will give you some idea of the new fruit and its worth to us down here, &c.

I remain yours, &c., H. H. SANFORD.

CARTHAGE, MO., May 12, 1879.

L. B. CASE.—*Sir:* * * * * We have some native plants here, which I think deserving of a place in cultivation. Among others, is the *Dodecatheon Meadia*, (white and purple) now in bloom, and the *Viola Delphinifolium;* they both do well in cultivation. A beautiful low growing pink Tradescantia—not the *T. Rosea* described in Wood's Botany—which blooms very early, the flowers coming directly from the root; but, I believe, as the season advances, they sometimes throw up a stalk with leaves and flowers; some are dark blue and purple, but I like the pink ones best. After a little, we shall have the wild Perennial Sensitive plant, or "Wise Briar," which, I suppose, is what Wood calls *Schrankia Uncinata*; it is very handsome and fragrant. There will be others as the season advances. * * * *

From statements made to me by many persons at and from the north, I am inclined to think you greatly underestimate the Tree Cranberry, (*V. Oxycoccus*) when you say none are of any economic value except the Black Haw. In western and northern New York, I have been refused the berries for planting, because they were wanted for cooking; and I know of their being a good deal used, and considerably prized, in Wisconsin and other places. Very truly,

JOHN C. TEAS.

* * * * Herbarium, * * * * July 5, 1878.

L. B. Case.—*My Dear Sir:* You will remember sending us last spring a tuber, which proved to be that of a Sagittaria. Now, this question in regard to S. variabilis bearing tubers, has become a puzzling one. It is not referred to in the books, nor do herbarium specimens show any evidence of the existence of anything like tubers. Yet it is reported from Oregon that the Indians dig them for food, and it is said to grow in San Joaquin Valley, California, and to be used there for food by the Chinese. Moreover, Dr. Engelmann says that he has for several years known that they did bear tubers, though he says nothing of it in Gray's Manual. Seeing a fine growth of the plant in our pond, I have to-day set a man to digging for the roots, but not a sign of a tuber do I find. The plants which you sent are the only visible evidences we have that they are ever formed. This by way of prelude. Now will you, as you have opportunity, be so kind as to investigate the species growing in your locality, gather specimens in flower and in fruit, and especially go to the root of the matter, and see when and where these tubers are found. If you will do this and report at your convenience, you will probably help our botany, and will oblige,

Yours very truly, S.

St. Louis, Mo., June 21, 1879.

L. B. Case.—*Dear Sir:* Your Sagittaria specimens, with effete tubers, are quite interesting. The fact that Sagittaria not only bears tubers, but possess the virtue only by the aid of these tubers just as the potato does and the Nelumbium, is well known. Many other plants, such as many ground orchids, do the same. They form in the fall as a receptacle of nourishment, and decay as soon as they are exhausted in spring or summer. Nymphæa is not so, but Nelumbium is eminently so, perennial only by the aid of such tubers.

Sagittaria Sinensis is even cultivated for such tubers, not only in China but also in California. I have long since tried to obtain the tubers to cultivate and study this species, but succeeded to get the tubers only last winter, and they were dead. They were about the same size as yours. Perhaps you, with your connections, can obtain them better—*late in fall*, would be the best time, I think.

Dr. Clapp, in his catalogue of Medical Plants of the United States, Philadelphia, 1852, p. 195, says of S. variabilis: Root is said to be acrid. Cooking destroys the acrid qualities of the roots, which have been used as food by the Indians and some of the inhabitants of Northern Europe.

Darlington, in his Flora Cestr., second edition, 1853, p. 305, says: Tubers 1 to 2 inches in diameter. Hogs are fond of the tubers and root them. Kelm, in his travels, (last century,) says they are sometimes as big as a man's fist. In first edition, 1826, he also speaks of the tubers, some of them the size of a goose egg; mild to the taste, and, I have no doubt, nutritious.

Why Clapp calls them acrid, I do not know. Here you have American authorities as far back as 1826!

Your tubers are of S. variabilis, Eng. The separate specimen is S. graminea, Michx., which used to be often, commonly called S. simplex, Pursh. I have distinguished S. variabilis, our American plant, from S. sagittifolia, of Europe, as early as 1840 or '41, but I think it was published first in Gray's Manual, second edition.

Sagittaria calycina, I discovered here about 1853, but it was published only in Torrey's Botany of the Mexican Boundary, 1859. This *bears no tubers*, but seems to be annual! Yours truly, G. ENGELMANN.

[The above letters, although not intended for publication, illustrate many points in our article so faithfully that we have violated the rules of privacy and confidence, but hope this explanation will prove satisfactory for so doing. The first letter, from Prof. S., illustrates the general belief in regard to the American form of Sagittaria among all botanists (himself one of the first botanists in the country) and collectors, while Dr. Engelmann's letter is, as usual with all his letters, replete with information.]

Perhaps nothing is so annoying to a business man as a delay or uncertainty in the carriage of his letters, which is oftentimes not only an annoyance but a serious loss; and this often arises in not being particular to spell out in full the address of the city or town and state to which the letter is sent. We have within the United States a city or town named Richmond in nearly every State, and the abbreviation of the name Indiana often sends our mail to Virginia or Iowa, from which places it is a long time in reaching us, and sometimes never does. We hope our correspondents will in the future be particular to give the full address:—

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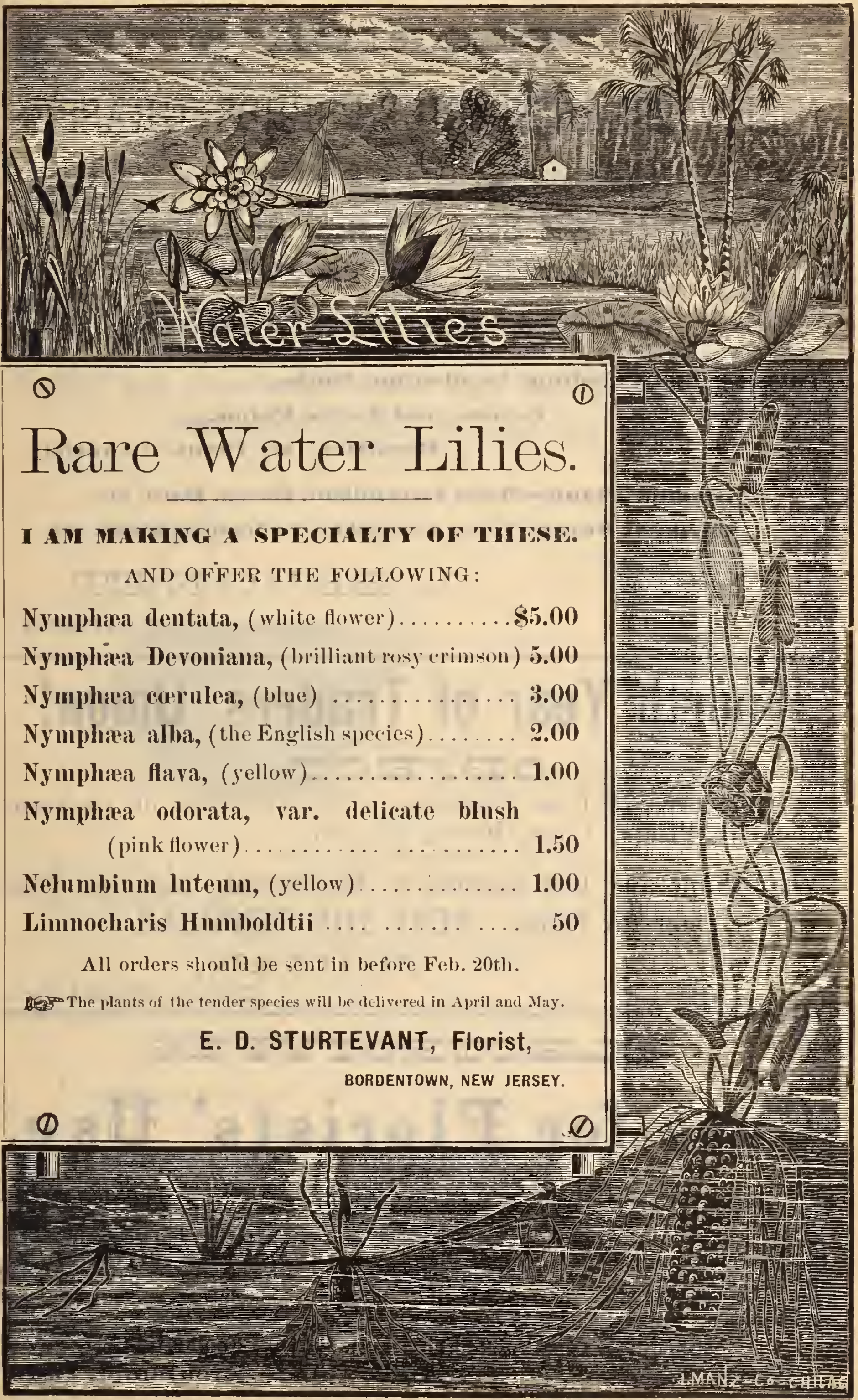

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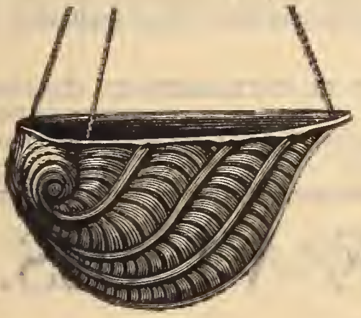

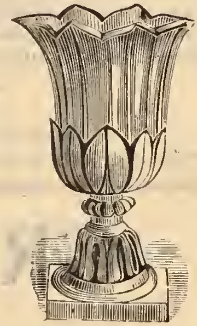

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BOTANICAL INDEX

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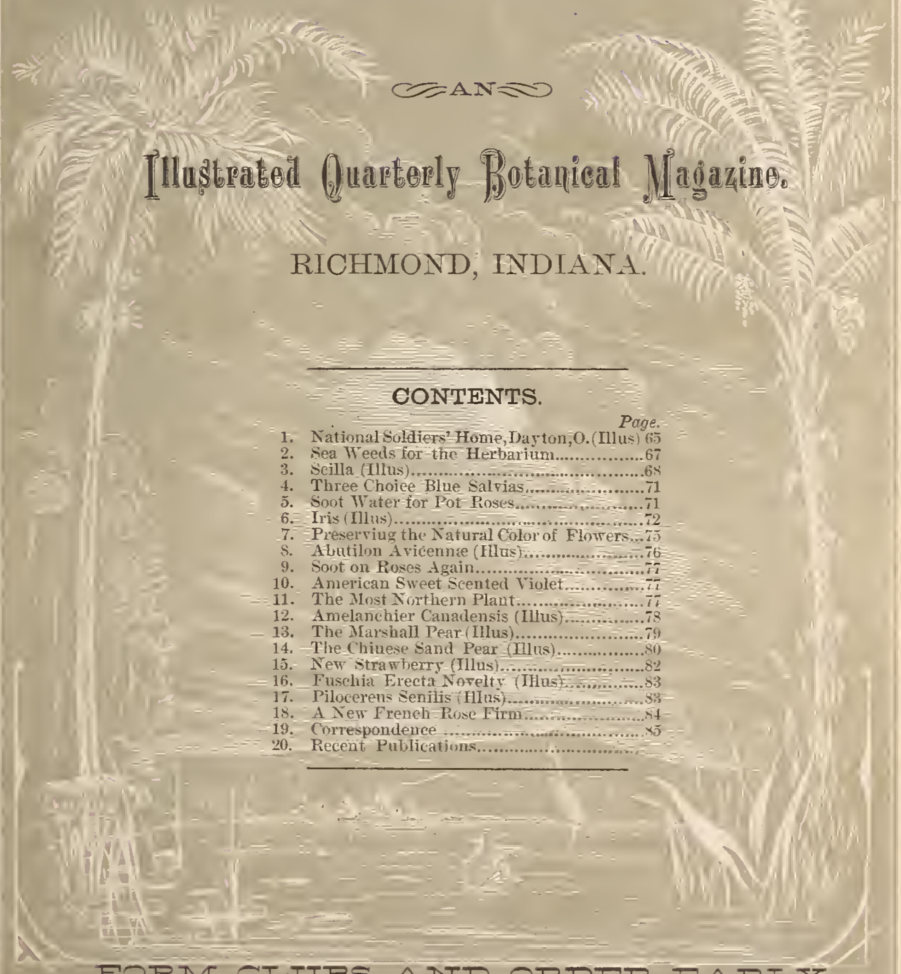

AN

Illustrated Quarterly Botanical Magazine.

RICHMOND, INDIANA.

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BOTANICAL INDEX

AN ILLUSTRATED QUARTERLY BOTANICAL MAGAZINE.

TORREY BOTANICAL CLUB
* NEW YORK *

VOL. 2.—No. 4. RICHMOND, IND., OCTOBER, 1879. Published Quarterly, at 50 Cents a Year.

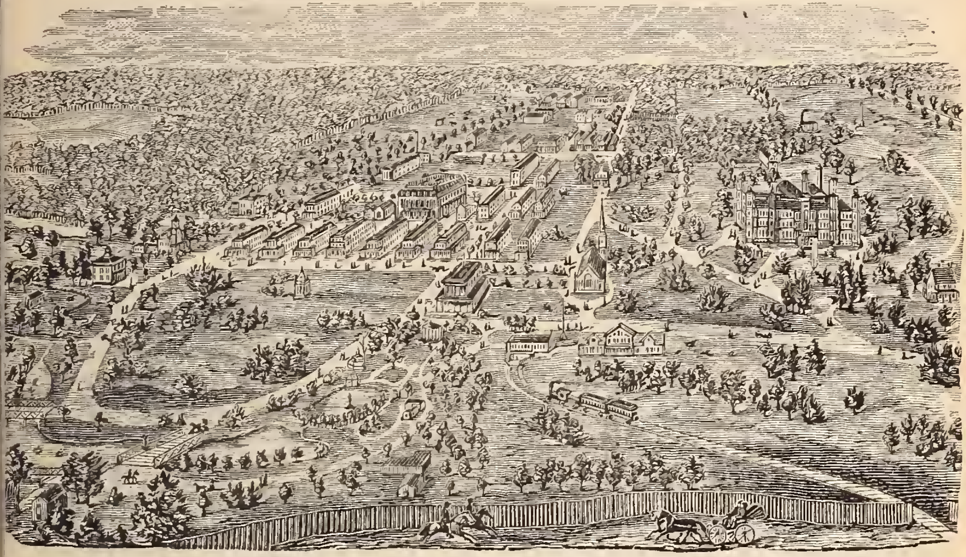


FIG. 138.

NATIONAL SOLDIERS' HOME, DAYTON, OHIO.

As many of our readers will probably never have the privilege of visiting this beautiful place, which the government has so kindly fitted up for those who were so unfortunate as to be permanently disabled for life in the service of their country, a brief description of a pleasant day spent in admiring its many beauteous wonders, may not be uninteresting.

It was a bright August morning, with a cool breeze from the north-west, when we landed at the Union Depot, Dayton, Ohio, and we soon found ourselves on board a train of the Home Avenue Railroad, bound for the Soldiers' Home, 4 miles from the city, through the highly cultivated fields for which Southern Ohio is famous. But the ride was short, and we were soon upon the grounds, which have been laid out with so much skill and taste by Chaplain T. B. Van Horn, of the United States Army.

Like all other military institutions, neatness and order reigns supreme everywhere, on the lawns, walks or drives, as well as in all the buildings. The grass on the lawns was trimmed to an even, velvety surface, but not so short as is usually seen on highly cultivated lawns, for experience has taught landscape gardeners that clipping grass so very short, as was the custom five years ago, soon starves the roots to death, and of course, kills the grass. There was not a leaf or stick to be seen lying on the walks through the grounds or on the stone steps leading up and down the terraces; everything is kept in perfect order by those whose duty it is to look after certain portions of the grounds, each day. The inmates, and in fact all connected with the Home, were dressed in the neat National uniform of blue, and no difference whether at work on the grounds, lounging under the trees and telling of their hair breath escapes in battle, or whiling away the time in the barracks, reading, writing, or in sweet communion with loved ones, perhaps, far away, or more likely, with those passed away, and the little group of photographs pinned to the wall by the bedside is all that is now left of a once happy family; still they all seem happy, and thankful that there has been a home prepared to make them comfortable in their helpless condition. Again, as if to impress the visitor with the true military character of the place, in nearly every prominent and conspicuous position were large mortar and seige guns of almost every form, with pyramids of shot or shell by their side; while one of the first objects seen upon entering the grounds is a battery of field artillery, immediately north of the depot, from which is given the usual military salute announcing the rising and setting of the sun.

We give at the head of this article a bird's eye view of the place, but of course, many things of great interest must necessarily be too dimly seen to obtain a good understanding of it. Again, each year, through the untiring efforts of its Board of Managers, many great improvements and changes are made, so that a view of the place this year will not fully represent all the improvements and additions of the next. Perhaps, it would be instructive to study the illustration at the head of this article, the cut of which was so kindly loaned us to use in connection with this article by the Home Avenue Railroad Company, Dayton, Ohio, whose trains leave the Union Depot every half hour, and land their passengers at a neat little depot directly in front of general headquarters. The picture gives a faithful representation of the Home as it was when the sketch was made, as well as a good general view of the improvements carried out up to that time. First, the large building to the right, in the centre of the picture, is the beautiful and commodious hospital, 293x40 feet wide in the main building, while the large diagonal towers and wings add nearly half as much more capacity to the structure, making it capable of accommodating nearly 400 patients. It is the finest building on the grounds and the most complete, in its interior arrangement, of any similar institution in the country. The next building, as shown in the picture, is the chapel, a handsome gothic stone edifice already well covered with growing Ivy, an almost indispensable accompaniment to a gothic church. Here we found that worthy friend of the soldier, Rev. W. Earnshaw, chaplain at the Home, in his study. Chaplain Earnshaw served his country during the whole of the civil war in the Forty-ninth Pennsylvania Volunteers, and is thoroughly alive to the responsibility resting upon his position. The next building seen in the picture is the general headquarters, 130x41 feet square. It contains the governor's rooms and offices, the office of the secretary and treasurer of the Home, the Putnam library, etc., and is well fitted up to meet the desired wants. Between the chapel and headquarters, but not seen in the picture, (as it was only just finished) stands the opera house, a large brick building, without much architectural beauty on the outside, but within it is one of the finest building in the west. From the balcony over the main entrance the visitor obtains excellent views of the beautiful surrounding landscapes, and of the city of Dayton lying directly in front and below, while the picturesque Miami Valley, with the surrounding hills, is seen to its best advantage, presenting a picture of unrivaled beauty. Directly in front of the chapel, and near the depot, to the right, is a large new brick building, to be used as reception rooms for visitors, offices, etc., while immediately back of headquarters are seen the homes of the soldiers, the barracks, each 100 feet long and 40 feet wide, while in the centre of the group stands the large spacious dining hall.

All the improvements at the Home are done by the invalid soldiers, of which are now 4,000 quartered there. They represent all kinds of trades and occupations, and as it is necessary to continually add new buildings for barracks, shops, etc., to accommodate the increased demand for accommodation, there is employment for all who are willing and capable of working. Nearly all the buildings are of brick or stone, and built in a permanent and substantial manner. At the present writing a large force is at work converting a natural valley of about 10 acres into a lake, which will be connected with the other three already constructed.

But our object in visiting this charming place was to see the grand success of Landscape Gardening and the Floricultural beauties developed in a few years, and although our expectations were high, still we found we had not over-estimated the beauties wrought by the hand of man in converting forests and bare fields into a small and beautiful city in a short space of time. Immediately in front of headquarters stand the Martindale conservatories and greenhouses, well filled with the choicest of plants. It is really a marvel of neatness and taste, and speaks volumes in praise of Mr. Charles Beck, its capable chief guardian. A number of the houses stand on the edge of the bluffs overhanging the lakes, while others are on the low ground adjoining the lakes, all being connected by long flights of stone steps, covered by a glass structure. As many of the houses were built since the cut at the head of this article was made, only 3 houses are shown in the picture.

The bluffs face south and east, and here again they have changed an unsightly hillside into a lovely garden, interspersed with numerous caves, grottoes, fountains, and springs of running water. Among the plants most at home here were Begonias, Caladiums and Vines, which seemed perfectly at home and grew in great luxuriance. Numerous large and stately trees, left from the native forest, still shade the banks and render it a most desirable retreat for the tired and footsore sight-seeer. In addition to the native trees we noticed many exotics, notably the cut-leaf white birch, which seemed to flourish much better than at any other place we remember to have seen it before. Among the choice specimens of floral skill was the word WELCOME, while the emblematic U. S. and national shield of our country form very attractive objects. But the gem of the place is a large five-pointed star 40 feet long, in the centre of which stood a very large and well grown specimen of Agave Americana, fully 15 feet high, indeed it is so large that it would be impossible to handle it except by keeping the tub in which it grows on a truck with broad faced wheels. Each of the five divisons of the star was planted with a separate variety of Coleus with as distinct and separate colored foliage as possible. Here was an admirable place to study the effect of the sun upon them, for it is well known that the leaves of many kinds of Coleus sun-burn, or fade out into a dingy brown, when exposed to the hot rays of the summer sun. We saw nothing more rich and showy than the old Coleus Verschaffelti, while next in point of beauty was C. Refulgens. Coleus Pictus, Zanzibar and Scotti made a poor show. In the space between each point of the star was a circular bed containing bright colored foliage plants; most conspicuous of all was the dark leaf Cannas, red leaf Coleus and some one of the dwarf white leaf plants, usually Gnaphalium lanatum; and as the ground outside of the star and circular beds was covered with a bright and fresh sod, the contrast produced was very striking and magnificent. In another bed near by was grouped together a great number and variety of large leaf tropical plants, such as Caladium Esculentum and Odorata, Musa Ensete, Cavendishi, Rosea, Paradisiaca, &c., together with a few tall Chamædorae, (Palm,) and in their moist and sheltered situation grew to perfection. As a rule, Musas are not desirable for bedding out, but here we saw M. Ensete 23 feet high, with all its leaves entire and making a truly tropical appearance, while beside it stood M. Cavendishi, Rosea, Paradisiaca and Sapienta, with their long recurved midribs swinging to and fro with nothing left of their leaves except bunches of ragged shreds of the blade that had been whipped out by the wind. In addition to the Musas and Caladiums already noticed, we saw fine specimens of Cycas Circinalis, Latana Borbonica, Chamærops excelsa, Brahea filimentosa, Caladium giganteum, Agave Verschaffelti, A. Xylinacantha, A. Parryi, A. Sislandi, A. salmianea, A. Ortgiesi, &c.

But this article would be incomplete without an acknowledgement of the attention and courtesies received from every one connected with the Home during our short visit there. The Governor, Col. E. F. Brown, commanded the Twenty-eight New York Regiment during the late civil war, and lost an arm at the battle of Cedar Mountain, August, 1862. The Treasurer, Maj. J. B. Thomas, served as Surgeon, first in the Army of Ohio and afterwards in the Army of the Cumberland. The Secretary, Capt. R. E. Fleming, served in the Third Indiana Light Artillery. Chaplain Wm. Earnshaw, as we have already stated, served first in the Army of the Potomac and afterwards in the Army of the Cumberland until the close of the war, when he was selected to locate and complete the National cemeteries at Fort Donaldson, Shiloh, Corinth and Memphis. Under this administration we find the local government of the Home all that can be desired, and each one vieing with the other in their efforts to make the place a home in reality, not only for the inmates, but an agreeable and pleasant resort for visitors, who are always welcome.

SEA WEEDS FOR THE HERBARIUM.

THE receipt for pressing Sea Weeds for preservation used by the Rev. A. B. Hervey, of Troy, N. Y., well known as an expert in that process, is as follows: Float out each specimen by itself in salt water, in a white dish,—take a wash-bowl. Put the paper under the plant in the water, arrange the plant on the paper, and carefully draw it out. Lay the paper with the plant upon it on drying paper, and spread over it a piece of white muslin; then spread over this a layer of drying paper, then more plants and then more cloth; drying paper, etc. Put all under a board, and weight it with forty or fifty pounds of stone or other heavy substances. The next day change the cloths and drying paper, and in one day more the plants will be dry and ready to go into the herbarium or the album, for permanent preservation.—*Scientific American of June 14, 1879.*

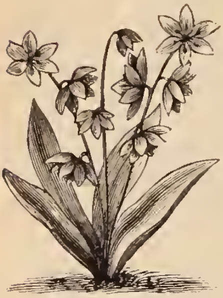


FIG. 139.

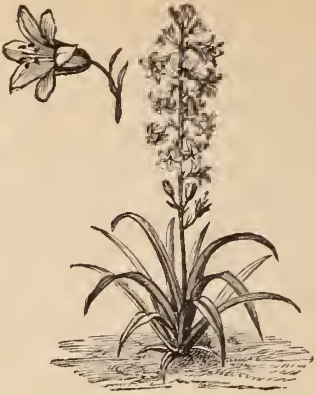


FIG. 140.

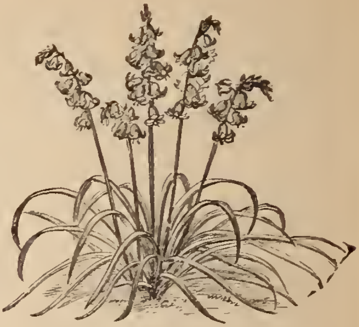
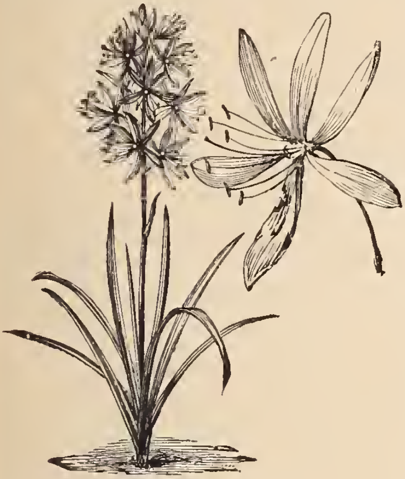


FIG. 141.

SCILLA. LINNÆUS.

IT is always desirable to add to the flower garden each year, a few varieties of hardy plants, bulbs or shrubs that may remain for a number of years undisturbed in the ground and still flourish or retain their usual vigorous characters under ordinary cultivation, or even seeming neglect. Many of our highly cultivated kinds of imported flowering bulbs make a truly grand display for one, or sometimes two seasons, but they soon deteriorate into their normal condition, and then are so inferior to freshly imported bulbs that they are not worth cultivating and must be replaced each year, or at most, every second year. For this reason something must be obtained of a more permanent character, or perhaps we should say, something must be used that has not reached such a high point of cultivation, that when it returns to its original condition it will not compare so unfavorably with the same varieties offered each season by dealers. Nothing seems to meet the desired wants better than some species of the *Scilla*, and for many reasons they are far superior to most any other bulbs. [1.] Cultivation has not yet worked the marvelous changes in the *Scillas* it has in most other garden plants, and the bulbs we purchase from the dealers are pretty sure to be the original species, and a few more years of cultivation will not be liable to leave us in possession of degenerated and worthless bulbs. [2.] The bulbs are usually small and capable of enduring a vast amount of exhaustion, and still renew their former vigor, with half a chance for life, while other kinds of bulbs loose all their vitality and die with even less exposure. Several species are natives of the far north, or of heigh elevations on mountain ranges in the warmer portions of the world, consequently they are among our hardiest plants, and capable of enduring any amount of freezing, provided, of course, they are planted in the ground; at the same time if they are planted rather deep in the ground, they would not be injured by the extreme heat of Summer. This is also a very important consideration with people living in the great central portion of the North American Continent, for the long, hot and dry Summer debars us, to a large extent, from producing the splendid show of flowers during a large portion of the year with which our friends in moister climates are favored. We have often suggested, and our observation bears us out in the assertion, that one great reason bulbous plants do so poorly, as a rule in the West, is their not being planted deep enough to withstand the *cooking process* of a western Summer's Sun; but to plant deep, the ground must be well drained and mellow, for if bulbs were planted deep in heavy clay, the delicate leaf and flower stem would never penetrate the tough, resisting mass. True, mulching would, in a measure, protect the bulbs from the heat of the sun, but *nobody* mulches plants and very few mulch trees and small fruit bushes; still every good catalogue and every Horticultural paper repeats the injunction—*mulch all young trees and small fruit plants.* The truth is, no one has time to do it.

Nearly all the Bulb Catalogues, issued by the nursery man and florist, contain the anouncement that the firm issuing said Catalogue offer for sale from one to a dozen or more varieties of *Scillas*, generally at a very low price. They are usually all foreign varieties, so offered, and being natives of a great variety of climates, are well adapted to all localities and conditions. The hardier species for planting in the garden, (Sept. and Oct. are the best months for planting) where they make lovely border for a walk or flower bed, and as they bloom so early in Spring, larger summer flowering plants can be planted so near them that their foliage will cover the whole ground without injury to the *Scilla* bulbs, and save room, which is often a consideration in the flower garden. They are also very desirable in a permanent bulb bed, and make a fine display with their many shades of blue when grown with such dwarf growing plants as Hyacinthus, Lily of the Valley, &c.; but their favorite position is along the border, or even planted singly on a lawn in the turf.


Scilla Fraseri. FIG. 142.

We have said nearly all the species offered by the florist are foreign, but occasionally one offers our native American species, *Scilla Fraseri*, (Fig. 142) which, by the way, has had a hard time to maintain an existence, (with botanists in its nomenclature,) for it has had its name changed so often by botanists, that it is quite doubtful if it can yet claim a secure resting place (on paper). It was first introduced to the floral world by Nuttall, under the name of *Phalangium esculentum;* changed by Ker to *Scilla Esculentum;* to *Camassia Esculentum*, by Lindley; to *Camassia Fraseri*, by Torrey; and last to *Scilla Fraseri*, by Dr. Gray.

The flowers are of a pale blue color, borne in an elongated raceme, on stalks from one to two feet high during May. Sepals widely spreading. The long, linear leaves are produced quite freely, giving the plant a luxuriant appearance in its native moist prairie home in the western portion of North America. The bulb is long and round, made up of concentric rings or layers like the Onion, and is one of the native food products of the North American Indian, enumerated and described in the U. S. Agricultural Report for 1870, which says:—"The root is dug in June and July. When eaten raw the taste is pleasant and mucilaginous, when boiled it somewhat resembles that of the common potato. The Indian mode of preparing it for future use is to dig a pit, line it with rocks, upon which a fire is made, and, when heated sufficiently, the heated stones are swept clean and the roots are heaped upon them; grass or twigs are next laid over the pile, and finally, a covering of earth. After several days the pit is uncovered, when the white roots are found to be converted into a thoroughly cooked, dark-brown, homogeneous mass, of about the consistency of softened glue, and as sweet as molasses. Cooked in this manner, the roots are often made into large cakes, by mashing and pressing them together, and, when slighty dried in the sun, they become rather pliable and tough, and look like plugs of black, navy tobacco. Its color does not recommend it to the taste, but it is sweet, mucilaginous, and agreeable as the fresh root, excepting a slight smoky flavor, acquired in baking. In its pressed form it keeps softer than in the raw state, or when simply cooked; and may be kept for a year or more. The roots, when boiled in water, yield a very good molasses, which is much prized, and is used on important festival occasions by various tribes. The Indians of Cape Flattery, the Nez Perces of Idaho, and those of Pitt River, California, are the greatest consumers of this article of diet, under the name of Kamass root." Perhaps it would not be amiss to say that the early colonists of both North and South America found the natives (Indians) making use of almost every root, plant and often even the tender twigs that contained any Saccharine, Farinaceous or Mucilaginous matter, and if it contained any poisons incorporated with it, a means had been devised to drive off the poisonous acids and still retain all the nutritious food principles.

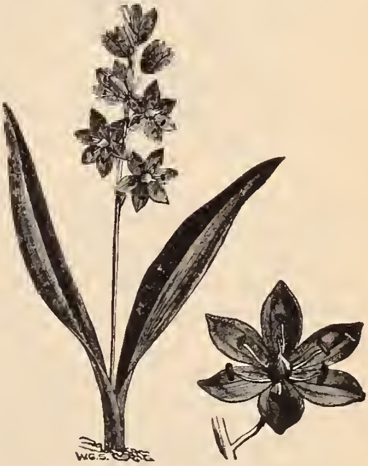


Fig. 143.

Another very interesting species is the SQUILLS,—SCILLA MARITIMA, or, as it is now called, *Urginea Maritima*, nominaly from Algeria, Africa; but widely distributed over the entire borders of the Mediterranean Sea. The bulbs are large and float about from place to place, never losing their vitality by the long sea voyage, but immediately, on being thrown upon shore, take root and grow luxuriantly, from which circumstance they have received the popular name of SEA ONIONS, from the inhabitants living in the vicinity. In an old work on Botany, now before me, I find the following interesting passage.—"They grow naturally on the sea-shore and in the ditches where the salt-water naturally flows with the tide, in most of the warm parts of Europe; so cannot be propagated in gardens, the frost in Winter always destroying the roots, and for want of salt-water they do not thrive in Summer."—This paragraph must be taken with a good deal of allowance in regard to salt-water, for bulbs in our greenhouses form immense clumps in a few years, each bulb being often three and one-half inches in diameter, and they certainly get no salt here. They will not, however, endure any frost. Our treatment of the bulbs is exactly similar to other tender bulbs. In the same work, I find:—"Sometimes the roots, which are bought for use, put forth their stems and produce flowers as they lie in the druggists' shops."—The numerous, fleshy fascicles or coats forming the bulb, are filled with a viscous juice, very bitter and acrid, and even corrosive, which contain a peculiar principle, called scillitine. The outer coating of the bulb is a thin, brown skin; while the fleshy, inner scales, in some bulbs are white, while others are of a dark color, and produce the Red Squills, an inferior drug, which, however, were reputed to be the extract from a less valuable medical bulb,—the *Scilla Pancration*. The drug obtained from the white-scaled variety, is the only marketable one in demand. • Squills are also used quite extensively for tanning leather.

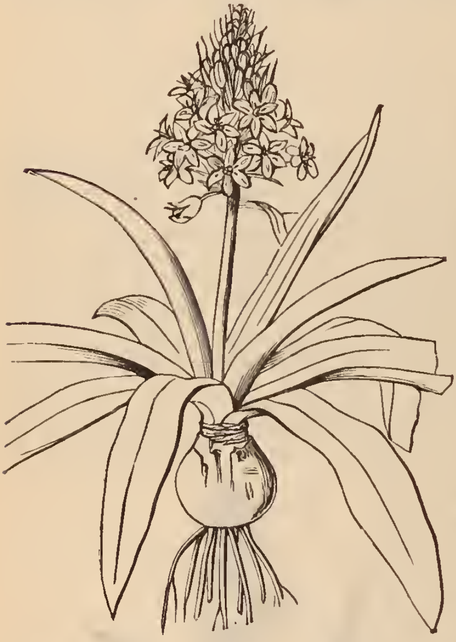


Fig. 144.

But it is among the smaller and less pretentious species, we are to look for the real gems for the hardy bulb garden, this time. First, and most lovely, is *Scilla Siberica*, (Fig. 139.) a tiny little plant, from that far off, inhospitable land, *Siberia*, with small, deep blue, bell-shaped flowers, produced on numerous small flower-stems, appearing one after another in a shade deeper, but very similar in habit. *Scilla Campanulata*, (Fig. 140,) from Spain, is another gem of beauty, with deep blue flowers, but like many other varieties of plants, the flowers shade off into white (*Scilla campanulata alba*) on the one hand, and into pink (*Scilla campanulata carnea*) on the other. Unlike *Scilla Siberica* and *Præcox*, this variety produces a single spike of flowers, a foot or more high. Fig. 143 represents *Scilla bifolia*, a native of England, with a lighter blue flower, but with two varieties,—white (*scilla bifolia alba*) and red (*scilla bifolia rubra*). Fig. 144 represents *Scilla Peruviana*, from Spain, which was introduced into South America by the early colonists, and so thoroughly naturalized, that subsequent travelers and collectors could hardly give up the idea of its being a native species. This species, also, has a violet-blue flower, borne in a miniature pyramid shape, on stocks about one foot high, and the two extra shades of flowers are also produced, *i. e.* white, (*scilla peruviana alba*,) and buff, (*scilla peruviana discolor*). Fig. 141 is the lovely Egyptian Hyacinth,—*Scilla Nutans*,—perfectly hardy, and producing numerous flower-stems, one after another, in early Spring, with flowers from a deep blue to a soft rose, it is really one of the most desirable species, and we are often surprised to note its absence in a choice collection of hardy bulbs; but, where there are so many worthy things to select from, of course many of the more serviceable plants are often neglected. The list of *Scillas* worthy of cultivation is a long one, and space would not admit of an enumeration of all the species; suffice it to say, they are all worthy of cultivation, and we hope to see more of them in use as they become better known.

Nearly all plants seem to have a standard or typical color for their flowers and from this standard color they seem to shade off by insensible gradations to both extremes, *i. e.*, very dark on the one hand, and very light, or white on the other. The standard color of the *Scilla* is blue, but when grown in very rich, loamy soil, a more intense or deeper blue is often obtained, while many species are naturally a very light blue, and at least nine species are pure white. Many of the true species are now offered by dealers in three or four colors, which are usually constant and quite distinct, while a few are a dirty white, or purplish rose color, and only indefinitely approach the desired color.

In conclusion, we might say they are among the cheapest bulbs offered, many good kinds selling for only 40 cents per dozen, or $2.50 per one hundred, while some of the better ones are worth 50 cents each, or $4.00 per dozen.

THREE CHOICE BLUE SALVIAS.

FEW plants are more worthy a choice place in the flower-garden, than the Salvia, or as they are popularly known, the Sages. They are of all colors and shades, from white to black; but blue is the predominant color, and as blue flowers are not very common in the nurserymen's list, we will say a few words in behalf of three varieties of blue Salvias we have growing.

First, and best of all, is *Salvia patens*; of a deep azure blue, large and bushy growth, corolla large and ample. It is very difficult to propagate from cuttings, and seeds are a long time in producing flowering plants, hence it is they are always an expensive plant. The roots may be taken up in Autumn and stored over Winter like a Dahlia, but it must never be allowed to dry or shrivel up; if they do, they will never start again. They should be planted in a large box of earth and kept quite moist, but not wet enough for the earth to sour. They should, also, be kept just as cool as possible without freezing, to prevent the plant from starting into growth. The English gardeners have left them out in the ground for the past few years and with a light protection they remain uninjured. The young, tender shoots must, however, be watched in Spring and protected from the lightest frost, which seems to permanently injure them. They flourish in any common garden soil, and if planted early, by pegging down the first shoots a dense thicket of flowering stocks can be obtained. By starting them early they will come into bloom by July, while by pinching out the end of the growing branches at intervals during Summer, their blooming season may be delayed till nearly Winter, and if they are carefully removed to the house or conservatory and grown in a temperature varying only a little from 45° to 50°, they may be had in bloom at Christmas.

Salvia Cacafolia is much easier to propagate, consequently, much cheaper. The flower is of a lighter blue color, corolla much smaller, still much more inflated than *Salvia Splendens*. The plant is of a dwarf or creeping growth and if encouraged by layering, will produce quite a mat of plants. They usually bloom later than *patens*; *i. e.*, commence about the time *patens* has partly become exhausted.

Salvia Splendens Hoveyi is a new variety or sport, raised by C. M. Hovey, of Boston, Mass., from the old *Salvia Splendens*, and still retains the character of *Splendens* in its habit of growth and long, tube-shaped corolla. It is a vigorous, rank grower, with foliage of a dark, metallic luster. The flowers are not a true blue, but with a dark, purplish shade.

It might be well to say these three Salvias are all of Mexican origin—(calling *Salvia Splendens* the parent of *Salvia Splendens Hoveyi*, a Mexican variety, which it is). There are over one hundred and fifty species of Salvias known, and nearly one-quarter are natives of Mexico. Perhaps many other forms of blue Salvia are worth cultivating, but we have never seen them. *Salvia Hoveyi* like its parent, *S. Splendens*, is very free to grow from cuttings, and of course, will soon be reasonably cheap.

SOOT WATER FOR POT ROSES.

IT MAY be well to again allude to the necessity for the frequent use of this. Worms have a particular liking for the soil in the pots where rich manures are used, on this account there are no plants that suffer more than Roses. The fact of their bearing strong stimulants admits of the soot water being applied somewhat stronger than would be safe to use for many plants. Before giving, it is well to let the plants get as dry as possible without the foliage being injured; then give them a thorough soaking, the effect of which is that generally in a few minutes, the worms, especially the large red ones make their appearance above the surface when they can be removed.—*The Garden*, (*London, Eng.*)

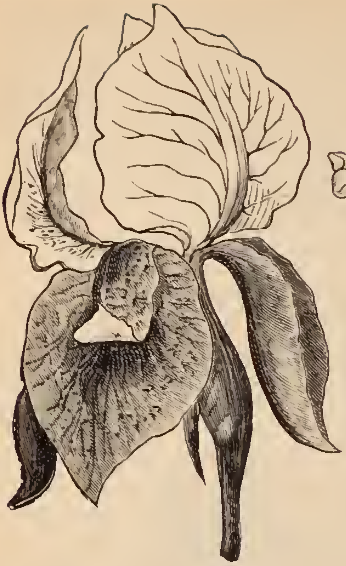


FIG. 145.

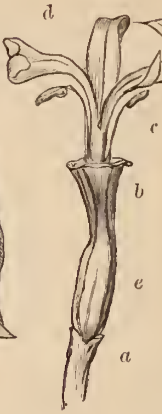


FIG. 146.

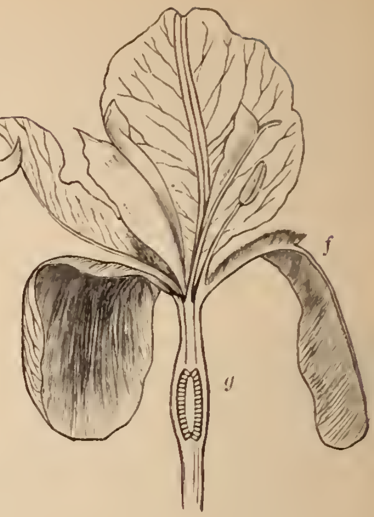


FIG. 147.

IRIS. LINNÆUS.

ORDER—*Irideæ.* Brongniart.

TYPE—*Iris Germanica.*

ETYMOLOGY—*Iris*, the Rainbow; [*Gr.*] the name of an Ancient Mythical Pagan Deity, symbolized by the rainbow.

[Seventh Paper.]

Of all the fairy tales and fables of Ancient Mythology, perhaps the most interesting is the story of Juno, the Mythical Queen of Heaven, surrounding the world with a transparent mist, which, pierced by the glittering rays of the Sun, produced the Rainbow, the archetype of *Iris*. Ancient Mythology, however, goes still further and tells us that Juno was attended by five deities and fourteen nymphs, but her most faithful attendant was *Iris.* But the age of fable is passed, and now we interpret the ancient ideas of the Rainbow, as the embodiment of all that is beautiful or *divinely fair*, and a fit companion for the Gods, of which they knew not, still, worshiped.

So much for the ancient origin of the name, while its application to the group of plants under consideration, is equally instructive. It was chosen by the early naturalist,—while the study of botany as a science was yet unknown,—to designate an indefinite section or group of plants, with especial referance to the *Iris;* all of which produce more or less brilliant and showy flowers, and all of which are unsurpassed for garden culture, especially, since the species and varieties now offered present such varied forms and well contrasted colors. Linnæus, in his effort to obliterate all the old botanical names, called the family *Ensatœ*, from the Latin *Ensis*—a sword—on account of their leaves being long, narrow and pointed, *i. e.*, sword-like. He, however, soon abandoned his name, and restored the old Greek name, *Iris*, which has been retained by subsequent botanist. In heraldry, the flower of the *Iris*, under the name of *Fleur-de-lis*, (pronounced by a corruption of the French language, *Flower-de-luce*,) was also employed as the royal emblem of France during the reign of the old Kings, consisting (in heraldry) of three flowers on an azure field. Its interpretation is "The Royal (purple) Lily, queen of flowers, the true representative of Majesty." Since the establishment of the Republics, as well as during the Empires of France, the *Fleur-de-lis* has ceased to be used as the national emblem; but, in some of its modified forms, it figures very conspicuously in the heraldric emblems of some of the oldest noble families of both France and England.

From a scientific point of view, or, more correctly speaking, in the natural order of the vegetable kingdom, the *Iris* approaches nearer the structure of the true Lily, than any other aquatic plant, at least, any one of which, we have written; for which reason, if for no other, we feel justified in treating of it as a Water Lily. But we know the propriety of calling it Water Lily, will at once be questioned by many, and we must add a word more in explanation, for, although some species are the exact reverse of an aquatic plant, still some of our American and European species are so much at home on the low, wet margins of lakes and rivers, and are even often found growing in shallow water, where the roots, and sometimes the crown of the plant, is often submerged during a large portion of the year, that we see no impropriety in adding the *Iris* to the list of so-called Water Lilies; particularly, as we propose to treat only of the American and European forms in this article.

Before we proceed further with this very common plant, let us abandon the idea of its being too commonplace and insignificant, to be worth devoting much time too, for of all *common* plants, of which this is often considered the least attractive, probably no one is so little understood, even by amateur cultivators, as this family of plants. Its flower is so very complicated, that very few, except botanists, really understand its structure, or at least we find quite a difference in the descriptions published by different authors and writers.

By a reference to standard works on Botany, we find the *Iris* distributed over the entire world, from the far north, to the southern points of land in South America and New Zealand; but, in its manor of growth, we find it assumes an entirely different character, in different portions of the world. For example:—In the hot and dry regions, instead of a creeping rhizoma, as with us, it concentrates all its vitality into a bulb or corm, which remains dormant during the prevalence of the drouth, but develops again into activity at the approach of the rainy season. These, of course, are not aquatic plants, and will not come under our present consideration. In America we have, at least, eight well defined species, usually found in shallow water or swamps, but occasionally found in quite dry ground, and presenting the strange analogy of producing flowers, of that unusual combination of colors, —yellow and blue,—two colors seldom found in the same flower, or even in the same genus. Indeed, we have often seen the statement in print, that in no genus of plants can two natural species, or even varieties be found, one with a yellow, and the other with a blue flower; but this is certainly a mistake, for numerous genera of plants contain one species with yellow, and another one with blue flowers; the examples of which may be cited, are *Crocus*, *Linum*, *Nymphæa*, *Nelumbium*, etc. It is not, however, a usual combination of colors, and as some species of the *Iris* produce flowers with both colors in the same flower, it adds an additional charm to their study.

Let us now examine the particular points of interest in our chosen subject for consideration. First, the portion of the plant commonly called the root, is, in this case, nothing more nor less than a prostrate stem, to which botanists have applied the name rhizome, which are, usually, only partly covered with earth, but sending down into the ground numerous small rootlets to supply the plant with nourishment. These prostrate stems and rhizomes in the *Iris* consist of a bundle of coarse and fibrous tissues, thickened with a large store of nutriment, in the form

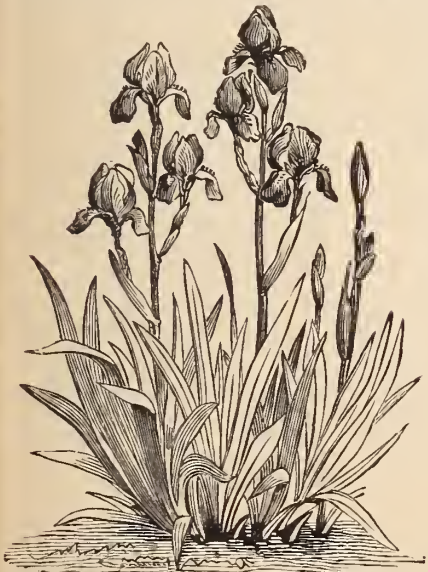


FIG. 148.

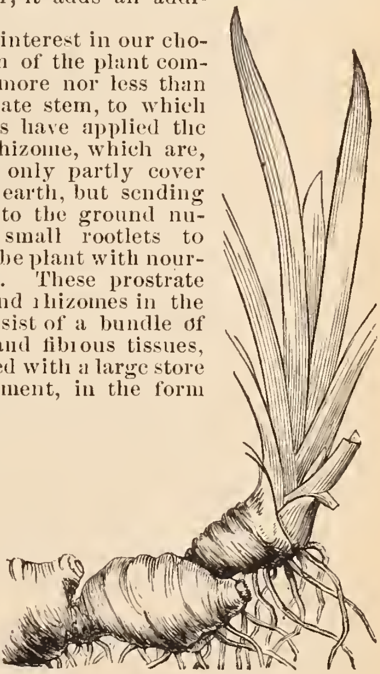


Fig. 149. (*From Prof. Gray's Botany.*)

of farinaceous and saccharine matter, well calculated to feed a luxuriant growth of foliage, especially in early Spring; and, also, to induce new buds or shoots to break out at the side of the old rhizome, and form a large clump or cluster, but which, in time, separates into distinct plants. These, like the stock of a hardy shrub, remain dormant through the Winter, or, in the language of botany, are perennial, and are usually seen in short, knotty sections, representing its period of growth, as seen in Fig. 149, from Gray's Lessons in Botany, and for which we are indebted to his kindness for the use of the cut to illustrate this article. The new growth takes place each year from near the growing end of the rhizome, while a corresponding portion decays from the old growth of former years, thus keeping a mature plant at about the same length, but by its branching out at the side of the rhizoma, in a short time a large clump is formed. Usually the growing end of last year was so immature and unripe when winter set in, that it had decayed to such an extent that the new growth must break out from a healthy and sound portion as near the end of the root as possible. Let us look again at the prostrate trunk or stock of the plant, to satisfy ourselves it is not a root in the true meaning of the word. Here we find a perfectly formed bud at the end of the stock, as all monocotyletllea or endogenous buds are produced, *i. e.*, growlng or unfolding from the end, and true leaves joined directly on the stock, and closely overlapping each other; so closely together do they stand, that when they have decayed each year, the rhizoma presents a series of scars or rings with some of the undecayed fibrous nerves of the leaves still attached, to mark the successive position of the leaves; all of which show us plainly enough that they are not roots, but prostrate forms of stems.—*Gray.*

The leaves are also very little understood, except by botanists, for in place of one surface facing up (towards the sky) and the other down (towards the ground) as is usual, or one surface facing the right and the other the left, as in some of the *Acacias*, etc., in the *Iris*, the leaf is linear or sword shaped, and erect; but "each leaf is formed and folded together lengthwise, so that what would be the upper surface is within, and all grown together except next the bottom, where each leaf covers the next younger one. It was from their stradling over each other, like a man on horseback, that Linnæus, with his lively fancy, called these equitant leaves."—*Gray's Lessons.*

But if the stems and leaves are curious and little understood, what shall we say of the flowers. They are erect, usually from a spathaceous bract of two or more leaves, produced, usually, singly in succession, each one opening but once, convolute in the bud in two sets, with no true calyx, but a corolla-like perinth, the tube prolonged beyond, and adhering to, the three-celled ovary, while the perinth appears to grow upon its summit; the perinth consisting of six nearly equal alternating parts, the three outer divisions reflexed or bent back with usually a bearded crest, (Fig. 146-*b*), the three inner ones usually smaller, erect or incurved, and bent towards a common centre. Stamens three, alternating with the three inner divisions, but opposite the three outer divisions of the perinth, with their linear and oblong anthers fixed at the base, and facing out towards the perinth and open on that side; Figs. 146-*c* and 147 show the anthers in position, the perinth-limbs being removed at *a* and *b*. The style (pistil) is short and single, nearly connate (united or grown together) with the tube of the perinth, while the three petal-like divisions or stigmas (Fig. 146, *d*) are distinct; opposite the three cells of the ovaries, reflexed and standing directly back of, and closely overhanging, the three stamens. The end of the stigma is notched and under this notch, on the lower face of the petal-like branch of the style is the real stigma, in the form of a thin shelf or short lip, which is stigmatic only on its inner surface. The peculiar structure of the flower of the *Iris*, together with the curious provisions for fertilizing the same, cannot be more clearly and instructively described, than has already been done by Prof. Gray in his entertaining little book, entitled, "*How Plants Behave*," which, by the way, is one of the choicest literary gems in the English language, and should be in the possession of every plant lover, whether they study it as an instructor in botany, or simply grow plants and flowers for their beauty. The following extract from the chapter on "HOW PLANTS EMPLOY INSECTS TO WORK FOR THEM" says:—"We notice that the stigma is higher than the anthers; but that is only a part of the difficulty. The anther and stigma face away from each other. The anther faces outward, and discharges its pollen through two long slits on the outer side only. The thin plate or shelf is stigma only on its upper or inner face which is roughened and moistened in the usual way for receiving the pollen; the face turned towards the anther cannot receive the pollen at all.'

It is easy to see from the above description of the construction of the flower, that it cannot by any possible means become fertilized, except by the aid of insects, and then can only be accomplished under the following conditions:—"When bees, for instance, visit the *Iris* flower, they alight upon the outer and recurved, usually crested or bearded divisions of the flower, (Fig. 147 *f*,) down the base of which is the only access to the nectar, contained in the bottom of the tube or narrow cup of the flower. The only access to this nectar (honey) is a narrow channel leading down the united bases of the six divisions or leaves of the flower. Now the three inner of these are upright, with their tips curved inwards, shutting off all access from that quarter; but the three outer and larger divisions recurve, and afford a convenient landing-place directly before the stamen and the over-arching stigma. When sucking out the nectar with its proboscis, the bee's head is brought down beneath the anther; when raised, it will rub against it and brush out some of the pollen; this, loosely adhering to its hairy surface, is ready to be deposited upon the shelf of stigma above; not when the bee leaves the flower, for then it only hits the outer face of the stigma, which is smooth and does not take the pollen at all, but when it repeats the action. Flying to the next blossom, the first thing which the pollen-powdered head of the bee strikes is the stigma, but this time on the upper face of the shelf or real surface of stigma, which takes some of the pollen brought into contract with it, and so is fertilized. Sinking lower, the head next brushes the anther downward, in entering for the nectar, then upwards in departing, and receives a fresh charge of pollen to be distributed upon the shelf of stigma of the next blossom visited, and so on."

The *Iris*, although not contributing directly to the support of the human family, except in a limited sense, has added its *mite* towards the comforts and luxuries, usually of semi-civilized people, in different portions of the world. The tuberous or bulbous rhizomas contain, in addition to the saccharine matter, a small portion of a fatty and acrid matter, together with a peculiar volatile oil which gives them stimulating properties. Some species loose their acridity by drying or boiling, and are then used as food, especially by the Hottentots, of South Africa, where it is called *oenkjes*, and has nearly the same taste as our potato. In its growing state, no animal will eat the leaves except goats, but when cut and dried like hay, cattle will quite readily eat it. The roots, however, are quite extensively utilized in different portions of the world. The old and well known violet perfume, "Orris Root," is the product of the beautiful, white-flowered species, *Iris florentina*, which was also at one time quite extensively used in flavoring or toning liquors. The blue perinth of *Iris Germanica*, crushed and mixed with lime, yields the "Iris Green" of painters. Finally the seed of *Iris pseud-acorus* are a well known substitute for coffee.—(*Hooker*). The roots of some species, especially *Iris pseud-acorus*, are used very extensively in preparing black dyes and ink.

Like most of our native semi-aquatic plants, it thrives in any common garden or mucky soil, requiring no especial attention; but it should remain undisturbed for a number of years, and then will bloom quite freely. The two English varieties, *Iris pseud-acorus* and *I. fœtidissima*, emit a disagreeable, fetid odor, not found in our American species, to any considerable extent. The dwarf Siberian *Iris*, *I. Siberica*, and the Austrian *Iris*, *I. Pumila*, with their many various colored flowers, form excellent border plants; and as they are so very hardy, in a few years they make a complete mat of green foliage, and carry out the object of a border line to perfection. Within the past few years, botanical travelers and collectors have secured an almost endless variety of these choice plants, from the far off and little known countries; and now our English cousins, especially, can boast of a collection that vie with any other class of hardy plants in the world, for beauty and well contrasted colors; while to say that some of the species are perfectly gorgeous, only indifferently describes their beauty. Of course our American plant buyers will never think of utilizing any of our native species, but we hope the day is not far distant, when we shall see this beautiful family of plants more generally grown, especially when our nurserymen advertise more carefully and generally, the new foreign varieties. European landscape gardeners make great use of even the most common varieties of *Iris* in their lawn decorations, especially in their planting by lake and river margins where the effect in all that can be desired. But the old world landscape gardening is on more of an elaborate and gorgeous scale than anything in America, consequently we see very little of this perfected art or science to copy from except near a few of our large cities, where the art has been applied to the beautifying of cemeteries.

PRESERVING THE NATURAL COLORS OF FLOWERS.

According to the *Breslauer Gewerbe Zeitung*, the natural colors of flowers and plants intended for herbaria may be preserved by dipping them from time to time in a boiling solution of eight grains of salicylic acid, in three-quarters of a pint of water, afterwards carefully drying them between sheets of blotting-paper.—*Gardener's Monthly*.

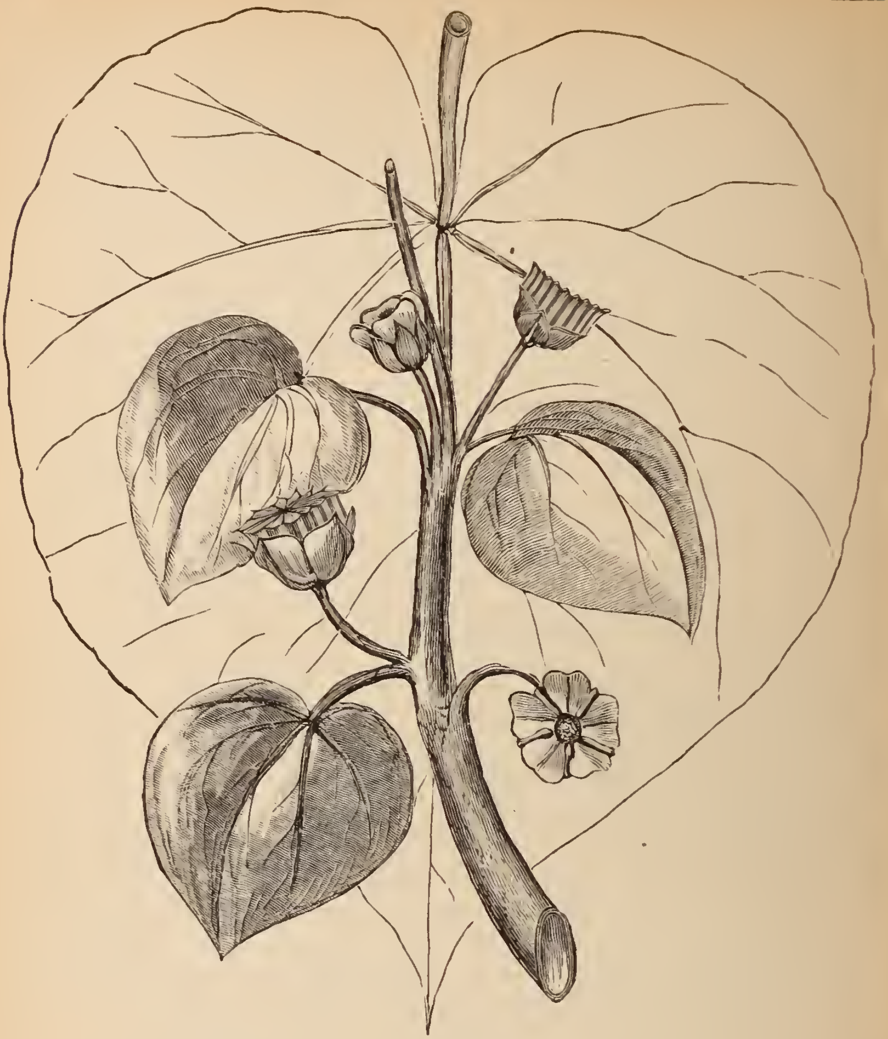


Fig. 150.

ABUTILON AVICENNÆ. Gærtner.

AMERICAN JUTE.

IT is always a pleasure to know of a new industry successfully added to those already in operation in our country, more especially when it utilizes any plant or article hitherto considered worthless, and much more so when it utilizes a pest or a nuisance. At the head of this page we give a figure of a small portion of the stem, with leaves, flowers and seed-pods attached, of a plant much reduced in size; always cursed by the farmers in the older settled portions of North America. Back of the stock is also given the outline of a leaf, natural size, which will enable any one to identify the plant immediately. Like many other common plants, several local names are applied to this one, such as Indian mallow, Velvet leaf, Cake seed, Devil's plant, etc. In botany it is known as *Abutilon avicennæ*, and was introduced into America from India, through England; probably, being considered by some of the early settlers as a good memento of home, (England,) and something capable of taking care of itself after once established. We never saw any one, however, that had any particular admiration for the plant, but now, since there must be a value attached to it and it can be so easily produced, it will make friends very fast.

The demand for a coarse and strong fabric for making rope and cordage, bags for grain, sacks for enclosing bales of cotton, and to meet many similar wants, has instituted an earnest inquiry among producers, manufacturers and shippers, and many efforts have been made to utilize something produced at home, but all efforts have failed until M. Emile Le Franc, in connection with the New Jersey Bureau of Statistics, discovered the long looked for article in the form of our Indian Mallow. But what is Jute? For although the name may be common enough, we venture the opinion that very few people know what it is. Jute is nothing more nor less than the fiber of two native plants of India resembling hemp, called Corchorus (*C. oliforius* and *C. capsularies.*) It is used very extensively in making Gunny Cloth, (another Indian name, and applied to a large, coarse cloth sack, which the Hindoo fastens on their animals to carry grain in,) mats, coarse carpets, cordage, and frequently mixed linen for cloth, as well as carpets. It is estimated that the manufacturers of the United States import annually $10,000,000 worth of jute alone, all of which comes from Bengal. It must, of necessity, also take the place of some of the hemp, flax and ramia, in addition to jute, for which we pay $30,000,000 annually to other countries. Of this quantity it requires about $4,000,000 annually to cover the bales of cotton, while the requirements to handle the grain crop, the wool, and numerous other products, is simply enormous.

The culture of this plant, provided of course its manufacture in America is attended with success, will no doubt be cheaply and successfully accomplished, as the plant always seems to thrive under neglect, being usually found in fence corners or similar waste, but very fertile places. Of course the larger the stock, the more profitable will be its cultivation, provided the supply does not exceed the demand; and as the stocks usually grow about six or eight feet high without cultivation, we may safely add one-third more with only ordinary culture. We notice in a Philadelphia paper that Messrs. LeFranc & Paliser offer through the New Jersey "Bureau of Statistics, Labor and Industry," straight "Jute" stocks, not less than three or four feet in height, delivered at Camden, for $8.00 per ton.

While we wish the enterprise success in the broadest sense of the word, we would not advise our readers to *go crazy* over it, and sow the seed of a great pest all over their farms, until they first know whether there will be a market for it when grown, for it produces an abundance of seed, and will spread with great rapidity when once it gets a foothold.

Messrs. LeFranc & Paliser, of Philadelphia, and A. Stoner, Esq., of East Baton Rouge, La., have patented machines for manufacturing jute, and now it only remains for experienced workmen to successfully place the manufactured article on the market, and compete for a part of the millions of dollars paid for importing an article of no greater value.

SOOT ON ROSES AGAIN.

Collect some soot from a chimney or stove, where wood is used for fuel; put into an old pitcher, and pour hot water upon it. When cool, use it to water your plants every few days. The effect upon plants is wonderful in producing a rapid growth of thrifty leaves, and a great number of richly tinted roses.—*Scientific American of May 31, 1879.*

AMERICAN SWEET SCENTED VIOLET.

It is remarkable that though we have numerous species of violet in this country, very few are scented. The Viola primulaefolia is exceptionally sweet, and is worthy of the attention of florists with a view to improvement. This species grow far North, having recent been found in Canada.—*Gardener's Monthly.*

THE MOST NORTHERN PLANT.

Among the plants collected by Dr. Bessels on his Polar voyage we noted as among the most northern of the plants he collected is a small dwarf Poppy, Papaver nudicaule, and a miniature Dandelion. The Poppy has been found beyond the eighty-third parallel of latitude, and is believed to be the most northern species hitherto found. It has yellow flowers, and is quite large and showy for so small a plant.—*Gardener's Monthly.*

NATIVE FRUITS.

AMELANCHIER CANADENSIS.—Torr. and Gray.

DWARF SERVICE BERRY.

THIS is a fruit that I have had in cultivation several years, with increasing satisfaction. The plant is a very dwarf one,—about the size of a Houghton Gooseberry plant;—say three feet high. It suckers freely, forming a clump like a Lilac bush, producing a great profusion of white flowers in early Spring, and is then as ornamental as the average *Spirea*. And again, when bending under its load of purple fruit, it is very attractive. It produces fruit so abundantly, even on small plants one and one-half to two feet high, that the branches bend to the ground. The berries, which ripen in June, are a full half-inch in diameter, and possess a very agreeable, sprightly flavor, with a delightful perfume. They are of a purplish red color, with a white bloom.

The fruit resembles, but is decidedly superior, to any Whortleberries I have ever seen in the United States or Canada, being larger, very much superior in quality, more productive, and also in being adapted to all soils and situations. It is perfectly hardy throughout the United States and in British America as far north as 60 degrees North latitude, and even further north, in Russian America. Elliott says in this far off region, millions of bushels ripen and fall to decay. Bears and other wild animals fatten on them, and the Indians use them as an article of food, both in a fresh and dried state. According to Loudon, "the berries make excellent puddings, very little inferior to plum pudding."

A variety of Dwarf Service is cultivated in Iowa under the name of Whortleberry, and is now being sold by the traveling tree peddler in several western states as "the genuine Whortleberry", one of the few instances in which the plant sold is better than if it was what it is represented to be.

There are other varieties of Dwarf Service under cultivation, that are not so dwarf as the one I am best acquainted with. These attain six to ten feet in height, and as far as I have been able to learn, produce smaller fruit than mine does. The Service Tree (*A. Canadensis*) is found occasionally in our forests, forming a tree twenty to forty feet high. It blooms pro-

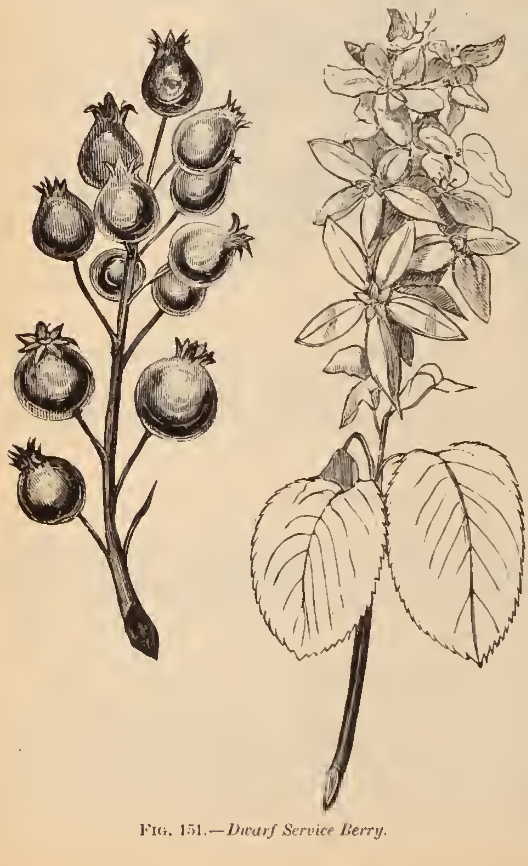


Fig. 151.—*Dwarf Service Berry.*

fusely in early Spring, flowers white, in panicles, and reddish purple fruit much smaller and less abundant than the dwarf form.

I have another *Amelanchier* sent me from Bloomington, Ill., as Dwarf Service, but the fruit, which is produced in clusters of ten to twenty, is small, about one-quarter of an inch in diameter, black, astringent, and of no value here. It ripens in August and hangs on the plant till frost.

A favorite plan of the Indians in preparing this fruit for future use is to take a tub holding twenty or thirty gallons, on the bottom of which bark of the spruce tree is placed; upon this bark a quantity of berries is laid; stones nearly red hot are next laid on; then another layer of berries, then hot stones, and so on until the tub is filled. The whole is then allowed to remain untouched for six hours, when the fruit will be thoroughly cooked. It is then taken out, crushed between the hands, and spread on splinters of wood tied together for that purpose, over a slow fire, and while it is drying the juice which was pressed out in cooking in the tub is rubbed over the berries. After two or three days' drying they will keep a long time, and are very palatable, more so when a few huckleberries are mixed with them.

E. Y. TEAS.

Dunreith, Ind., Aug. 30, 1879.

THE MARSHALL PEAR.

BY P. H. FOSTER, BABYLON, LONG ISLAND.

THE above named little known Pear, is now being introduced to the horticultural world through the Babylon nurseries, of P. H. Foster, Babylon, Long Island; and a history of its origin may be interesting to our readers. It was first noticed by J. T. Whipple, a nurseryman living in Washington County, N. Y., on the farm of Mr. Marshall, but as Mr. Whipple soon after gave up the nursery business and removed to Long Island, its distribution as a new fruit, was delayed a number of years. Mr Whipple, however, brought scions of this Pear to his new home, and upon its fruiting, it attracted the favorable attention of Mr. Foster, who is so delighted with its merit and worth, that he has propagated quite a stock, which he is now distributing, with the fullest assurance of a really worthy, new variety.

The above cut simply shows the shape of this most excellent fruit, and its full size. Mr. Whipple, the original discoverer of it says:—"I consider it as good a bearer, and of better quality than the Bartlett."—John Robbins, Esq., of Babylon says:—"As to quality, it stands as number one on my list."—Thomas Meehan, Esq., editor of the *Gardener's Monthly*, says:—"Few Pears will excell it in flavor; we regard it as a valuable acquisition, and we say this, knowing full well that the list of Pears recommended for cultivation is already too large."

The tree is moderately vigorous, very productive, fruit rather large, bell-shaped, greenish, russet yellow when ripe, thin skins; flesh white, juicy, buttery, flavor neither sweet nor sour; about ten days later than the Bartlett, as good a bearer, and better fruit; smooth, does not crack nor canker, and is always much admired when growing and when ripe.

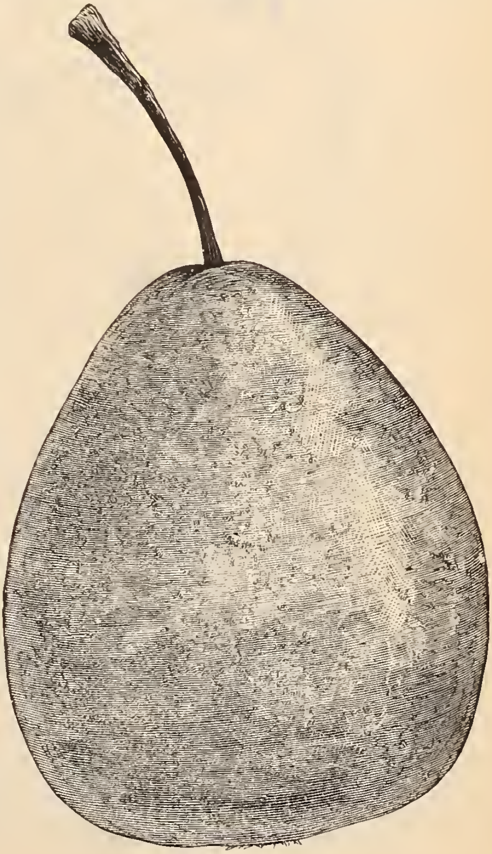


FIG. 152.—*The Marshall Pear.*

THE CHINESE SAND-PEAR.

TRANSON BROTHERS, ORLEANS, FRANCE.

BY what we know or have heard of the Japanese sorts of Pears, which have been introduced in Europe, we think that their right place is in the ornamental garden more than in the orchard, as not one can be ranked among the *good* fruits. Their fine, erect growth, their large, serrated, shining leaves—larger than any other sort, their white flowers, somewhat tinted with rose, as in Mikado, with their largely divided, round petals, give them an appearance which is different from all other sorts of Pears.

The fruits of the two varieties we possess, are:

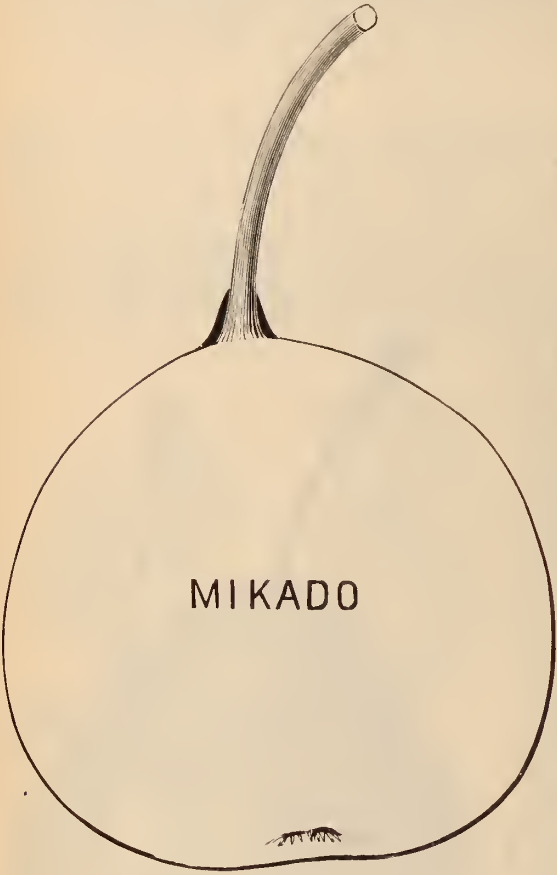


Fig. 153.

Mikado, Fig. 153: Fruit somewhat in the way of the Crassanne; skin green, of a fine yellow color when it is ripe, never colored; slightly spotted with rough russet dots; stalk about two or three inches long, knobbed at apex; flesh coarse, yellowish, mixed with large proportions of sandy concretions, very watery, with a peculiar flavor which has something of the quince taste. The fruit of the Mikado ripens from October to December. When ripe the fruit does not keep long, and is never good.

Von Siebold, Fig. 154: Fruit borne in clusters from two to five together, globular, about two inches in diameter; stalk about two inches long; skin brown in the way of *Beurre Capiaumont*, spotted with white freckles; flesh coarse, gritty, sandy, yellowish, moderately sugared, with very little perfume; ripens in autumn, and soon decays.

These sorts cannot be recommended as good fruit, and can be grown only as curiosities, as they are very ornamental with their large and numerous flowers sometimes tinted with rose, and their leaves which are the largest of all the other sorts of Pears.

The Japanese Pears live on the Quince stock, but they prefer to be budded on the Pear stock.

[It is a well known fact, to fruit growers, especially, that Pear trees, as a class, are very badly diseased, and often short lived in America, and anything that can be done to improve the stock should be utilized, for the good varieties of Pears are among our choicest fruits. It is the almost universal judgment of horticulturists who have grown the Chinese Sand Pear, *Pyrus floribunda*, that they are perfectly free, or nearly so, of that terrible blight, so fatal to the Pear stock now in cultivation in America—the descendants of *Pyrus communis*, the native wild pear of Europe. True, the fruit of *Pyrus floribunda* is of itself not edible, or at least not a valuable dessert fruit, but by fertilizing the Chinese species with the pollen of some of the choice varieties of *Pyrus communis* now in cultivation, we shall soon be in possession of a small healthier race of Pears, and varieties just as valuable for dessert and culinary purposes. Again, the Chinese species seems to take more kindly to our soil

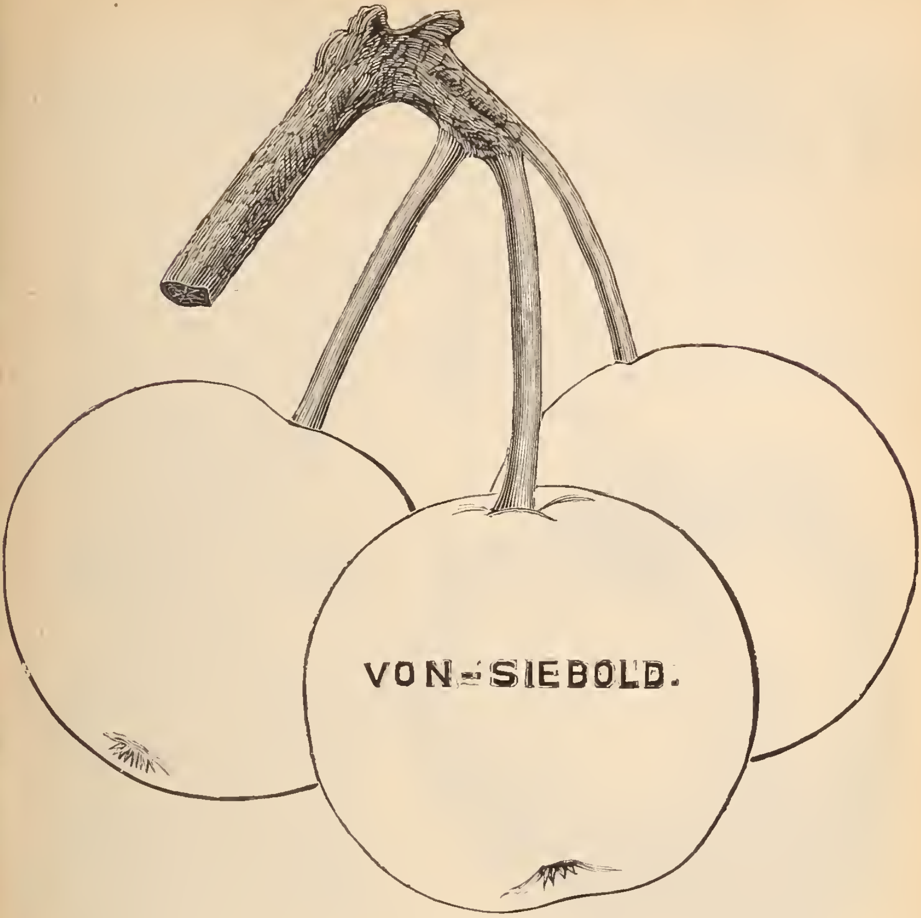

VON-SIEBOLD.

FIG. 154.

and climate than those of European origin, and will make a healthier and longer lived tree.

There is a very strong resemblance in both form and quality of the three varieties of *Pyrus floribunda*, described and figured in the April number of the BOTANICAL INDEX, and the French variety *Mikado*, figured above, and no reasonable doubt can exist of their being all of the same origin or species; while the *von Siebold*, from our indefinite knowledge of it, we should say was of a different and distinct species, but all are certainly of Oriental (China and Japan) origin, and entirely distinct from the European species, from whence we in America obtained our entire stock of cultivated and edible Pears.

We are very much interested in this new Oriental species of Pears, from the fact of its appearing to be more congenial to our climate and soil, as well as from the splendid fruit obtained by its being hybridized with *Pyrus communis*; for there is certainly no finer flavored fruit in market, than the LeComte and Kiefer's Hybrid, and we hope that each of our nurserymen will at once arrange to add at least one new Hybrid to the meager list now known.

The above two varieties, the *Mikado* (Fig. 153) and the *Von Siebold*, (Fig. 154), are all we know of in Europe, at least it is all we have seen in their Fruit Catalogues; and in the April number, 1879, we figured and described all the original varieties we knew of in America, together with Kiefer's and Garber's Hybrids,—two excellent varieties, and intended to have had an outline of the LeComte, but neglected to do so until to late; so that we have given in the BOTANICAL INDEX about all the information accessible in regard to the Pears.—ED. BOTANICAL INDEX.]

NEW STRAWBERRY, HUDDLESTON'S FAVORITE.

EACH year adds at least half a dozen new varieties of Strawberries to the already long list, and each one, of course, must be considered the best. However, only a few ever come up to the required standard, or at least only a small portion retain their superiority with ordinary cultivation, such as they must necessarily receive in the market garden. This being the case, we naturally look with much interest to the reports of practical fruit-growers for their opinion respecting every new fruit offered. The above named new variety of Strawberries having been grown for the past five years on the grounds of several different horticulturists as well as amateur cultivators, has proved a genuine, distinet and constant variety worthy a place among the very best. It was found growing between a row of Wilson's Albany and a row of the Agriculturist, in the garden of Mr. D. Huddleston, who was so well pleased with it that he immediately commenced its propagation and culture. From the appearance of the fruit it evidently came from the seed of the good old Wilson's Albany, fertilized with pollen from the Agriculturist. The plant is a vigorous grower, very hardy, standing the late frosts in spring much better than the Wilson, Monarch of the West, Kentucky, &c., with large, glossy foliage, which does not sunburn in summer. The fruit, which is faithfully represented in the illustration, Fig. 155, is of the very largest size, of a bright glossy crimson, flesh scarlet next the outside, paler towards the centre, firm, uniform in shape, ripening evenly throughout, with a rich, spicy flavor. but not so tart as the Wilson; an excellent shipping berry. Plant very productive, and the large size of the berry, holds out well to the end of the season.

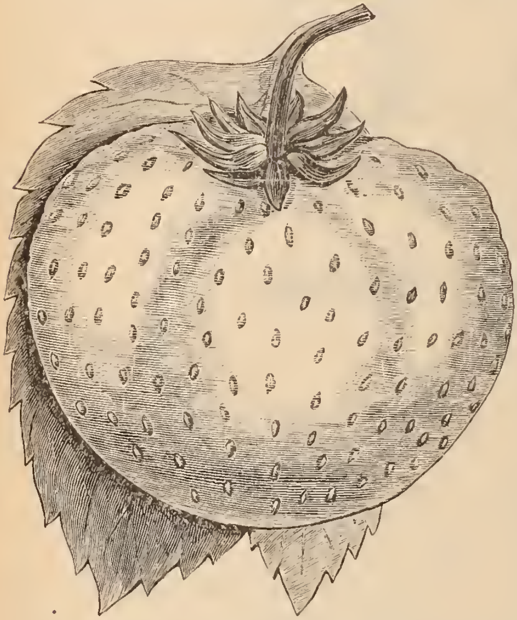


FIG. 155.

E. Y. Teas, of Dunreith, Indiana, is the possessor of the entire stock of this valuable Strawberry, and all communications regarding it should be addressed to him. In his circular, announcing his choice fruits, he says in regard to Strawberries:

"Pot grown plants, of many of the newer varieties, are grown for those who wish for a good crop of berries as soon as possible. These, if planted during August or September, may be relied upon for a crop of berries the following season. 'A full crop in nine months.' 'One hundred pot-grown plants will produce more fruit and finer, than a thousand ordinary layer plants set in the fall.' Pot-grown plants cannot be sent per mail. Layer plants will be sent prepaid per mail at the dozen and hundred price." Our advice would be, pay a little more and get plants by express.

NEW STRAWBERRY, THE GARDEN.

Another new Strawberry, called The Garden, is being offered by P. H. Foster, of Babylon, Long Island, (N. Y.,) that has received the commendation of many prominent horticulturists as well as the horticultural press in general, but as we have never seen the fruit we can not speak of its merits from personal knowledge, but from its strong recommendation it must be of value and well worth a trial. It is a seedling of the "Monarch of the West," large and handsome, fine flavored, and has already taken several first-class premiums.

NEW & RARE PLANTS

J. B. CASE
RICHMOND
IND
CASE
IND. RICHMOND
FROM
J.V. & S.
LONDON

[We would request any one having new or strange Plants, to send us a notice for publication in these columns.]

FUCHSIA ERECTA NOVELTY. CANNELL.

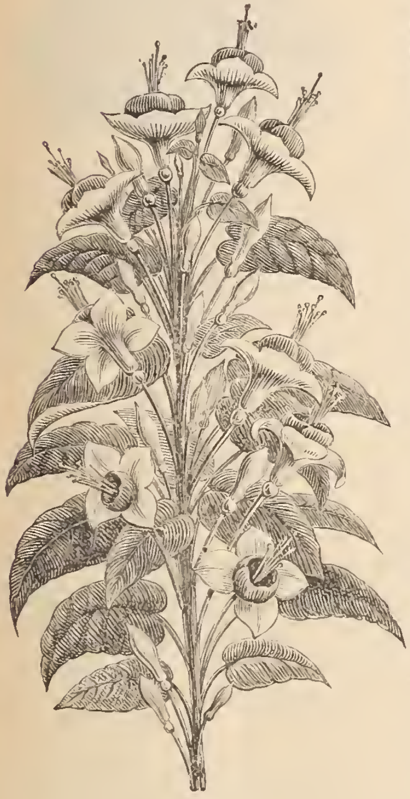


FIG. 156.

THERE appears to be no limit to the strange or unsual forms and colors of the vegetable kingdom, especially in the hands of careful and patient cultivators. A Fuchsia with an upright flower, would seem to be anything but a Fuchsia; at least, it would seem so to us, without seeing it. Still it is a fact, and we give at Fig. 156 an illustration of a flowering plant, from the pen of Henry Cannell, the celebrated nurseryman of Swanly, England, who has made it known to the plant-loving world, in his admirable Catalogue of New Plants, for 1879.

Fuchsia erecta novelty was raised by the late Mr. Wyness of BUCKINGHAM PALACE, in 1856, and exhibited by him at the REGENTS PARK FLOWER SHOW in 1858, where very little notice was taken of it. It was, however, widely distributed over England, and now nearly every greenhouse in the Kingdom possesses specimens of it. As seen in the picture, it produces erect flowers well above the foliage, with tube and sepals stained with white; sepals broad and well reflexed; corolla light pink margined with rose; plant a free bloomer of strong and branching habit, and what is of more value, it is the best of all light flowered Fuchsias for bedding out.

In a private letter from Mr. Cannell, he says:—"Although I have it under the name '*erecta von novelty*,' it should not be '*von novelty*,' but simply *erecta novelty*."—The idea has been given out that it is a French production, and the use of the monosylable *von*, gives plausability to the error.

PILOCEREUS SENILIS.

NO plants are more curious and strange than some varieties of Cactus, and as some of the strangest forms are so seldom seen, we give an illustration (Fig. 157) of one of the number, the well known "Old Man Cactus;" so called from the numerous tufts of long, white, flexible spines, which strongly resemble the gray hair of an old man's head. The species is a native of Mexico, usually a cylindrical or round stem of a foot or more in height, as seen in cultivation, but in its native country it often reaches twenty or twenty-five feet in height, and ten inches in diameter. The stem is divided into thirty or forty narrow furrows, with corresponding ridges, from the summit of which are the thickly produced tufts of white spines, so closely set as to give the whole plant a wooly or hairy appearance.

Like all other species of plants, cultivation has increased the number of varieties, differing a little from the original, one of which has been described in *The Garden*, which we give.

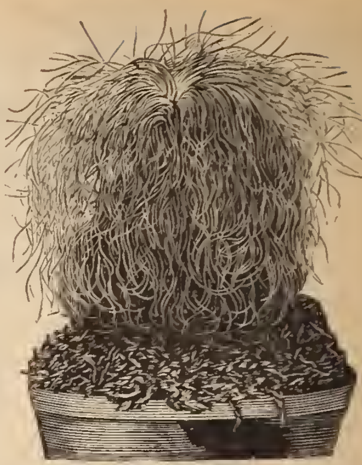


Fig. 157.

PILOCEREUS SENILIS, VAR. LONGISETUS.

This very remarkable and interesting plant is, I think, rather rare in collections, and is in most respects identical with *P. senilis*, but the great difference is, that it produces very long spines; the long needle-like spine is upwards of an inch long, and the hair-like spines are of a great length, especially near the base of the plant, upwards—some of them as much as eight inches in length, and are curled and twisted round the plant and over the pot, giving it a very venerable appearance. Even in youth it looks aged, and from its slow growth it never occupies much room, and is at all times a very attractive and interesting plant, gaining admiration, as it often does, from non-interested individuals, and many remarks from the casual observer.—*F. S. C.*

There are several varieties of Cactus in cultivation, producing a long, flexible, hairy-like spine, strongly resembling *Pilocereus Senilis*, that make choice specimen plants, and are rather commonly found in America, and often labeled *P. Senilis*, but are, of course, mis-named. It was our misfortune to grow and sell one of the number, but we have made an effort to recall all we sold and, probably, have done so. We received our original stock from a reliable and trusty dealer, who received it from *Pfearsdorf*, and was as badly disapointed as any one can be.

A NEW FRENCH ROSE FIRM.

THE great rage for new and choice plants has induced a large number of plant lovers to invest in the Nursery business, as a means of profit as well as pleasure. This is particularly the case with the fruit and flower loving people of France, and as their climate is so admirably adapted to growing to perfection many kinds of fruit and flowers, it is a great pleasure to be engaged in such a business. Nearly every one knows how successful they are in Pear culture, and now, in Rose culture they seem to almost defy competition with the balance of the world. In a private letter received only a short time ago from that devout friend of horticulture, Jean Sisley of Lyons, France, he says:

"One of my sons has taken a fancy to Rose growing; he began last year, and has now several thousands for sale, of the best old varieties; and can easily procure those he has not himself from his colleagues. The Roses grown here are all budded on the seedling brier, and cultivated since last year in the open air, and therefore make now strong plants, which can stand a long journey. I therefore beg you to recommend my son to your friends and acquaintances; they will be well and honestly served. The old varieties are worth here 50 *f.* (or five dollars) per hundred for the trade; of course new varieties vary in price."

We should be pleased to know that our friends in America, who are in need of Roses by the quantity, have corresponded with him on the subject, for no doubt it would be to their advantage. Letters may be addressed to Jean Sisley, Rue St. Maurice-Monplaisier, Lyons, France, and will be immediately forwarded to their destination. It would be needless for us to say to the well informed horticulturists in America, that Jean Sisley stands at the head of the long list of eminent horticulturists in France; but as many of our readers may not have had an opportunity of learning of the progress made in this department abroad, we will say that M. Sisley is an old French horticulturist, 75 years old, and has devoted a large portion of his life in his favorite study. He originated the first Double Geranium, and has been equally successful in all his undertakings.

CORRESPONDENCE

[We solicit the privilege of publishing extracts from correspondence, of interest to the general reader. Correspondence upon Botanical subjects respectfully solicited.]

PHILADELPHIA, PENNA., July, 1879.

L. B. CASE, ESQ.—*Dear Sir:* I find the INDEX still full of interesting matter, and always feel glad to note its persistent advocacy of the greater appreciation and more extended cultivation of our native plants, which have been so sadly neglected or ignored by plant lovers. This I consider a very hopeful sign, and see no reason why the INDEX should not, from its small begining, grow into a firmly rooted journal of progressive usefulness. Indeed this will certainly be the case if the standard be kept high.

Your articles on *Pontederia*, *Sagittaria*, &c., have brought to my mind some facts which I have been prevented from communicating earlier. Concerning *Pontederia*, I have myself observed it on lakes and rivers in the interior of Minnesota, in latitude about as high as the source of the Mississippi, and believe that it is to be found almost every where possible for it to grow throughout the state. Wherever it grew, it was well established and vigorous. The Odjibway Indians call it "*Mosotawug*," meaning "moose-ears," from the shape, and possibly at the same time, from the leathery texture of the leaves. I have observed the *Pontederia* in very many localities, and I think that, perhaps, the handsomest plants I have found, grow in Swartswood Lake, in the upper part of New Jersey. They are upright in habit, luxuriant in growth, rich and glossy in color, while the stems are slender, and the leaves seem to be quite narrow and unusually sharp, approaching somewhat the form of *Sagittaria*. Many of the clumps are quite elegant. The Japanese had, during the Centennial, in the little garden attached to their Bazar, some plants of a *Pontederia*, (?) very slender in form, somewhat trailing in habit, and light green in color, bearing conspicuous *blue* or *white* flowers in short spikes. The number of flowers in a spike was but from four to six, but they were as large as medium sized violets, which their appearance somewhat suggested. The plants grew and bloomed perfectly in the circumscribed quarters offered by a china bowl or bronze basin, containing ooze and water.

With respect to *Sagittaria*, I have obtained its tubers in northern Minnesota, in the latter part of September. None of those I got were larger than pigeon eggs, while some were quite small. The latter were obtained from plants with leaves nearly linear and which grew on mud flats in rivers, while the former came from swamps. The larger, my Indian guide called "*Wabisipin*, a Swan Potato;" the smaller, "*adjidojakopin*" meaning "Bittern Potato." The name "*Wabisipirikan*," signifying a place "where the Swan Potato abounds" seems to be a frequent one with the Indian, and carries out their usual method of living names. These tubers are by no means "acrid" as they have been stigmatized. Their taste when raw was farinaceous, or rather starchy, with a slight rankness of flavor; on the whole, very much like a raw potato, and I have no doubt that when boiled they would be quite as palatable. One can usually obtain these tubers by simply digging, without following downward particular plants. Mr. Nuttall gives an interesting account of the method of gathering them, pursued by the Indians of the Columbia river, by whom they are called "*Wapatoo*." This may be found in Audubon's Ornithological Biography, vol. V., p. 288, or in the small illustrated edition of his work, (Birds of America, 8 vols., 8 vo., New York, 1870) vol. I., p. 236. I have examined *Sagittaria* in Pennsylvania during July, without finding any tubers. The plants all came up easily, there being nothing, apparently, to retain them save the crown of fibrous roots; I found no indication of a tuber or of even a leader thereto. In the Japanese Bazar garden, already spoken of, were several plants of a very double *Sagittaria*, with full arrow-shaped leaves; the flowers were white, large, and had the petals so abundantly and closely set, as to give them a convex or button shape. The plants are free bloomers, spikes long and flowers numerous, making a very handsome and effective appearance.

I have had various opportunities, when in Minnesota, of observing the *Zizania Aquatica* in different stages of growth, besides having lived on the grain to a considerable extent. As may be supposed, its habit and character *there* are markedly different from that of the *Zizania* in this immediate neighborhood. Here the plant is found growing, usually on mud left bare by the receding tide, but in some places it invades comparatively solid ground; it, however, grows with the greater part of its length out of, or above the water; the seed are sweet though insignificant in size, and they commonly fall so that their stiff arm runs down into the mud, leaving the grain end projecting. In Minnesota, however, this plant grows directly in water, from three to ten or more feet in depth, upon mud flats fringing the banks of rivers and shores of lakes, while it sometimes wholly fills up the smaller lakes. The flower appears but a couple of feet above the surface of the water; indeed, I do not remember having seen heads much over three feet from the water, in any stage of growth or perfection. Winds beat them down so that they are frequently seen all slanting in one direction. When the grain ripens the Indians gather it in canoes as you describe. I have understood that in some places they tie a number of heads together over the area to be gathered, before beating off the grain; but of this I am not certain. The rice swamps become the resort of all sorts of wild fowl, and, indeed, of almost everything that has feathers, and on this nutricious fare they become fat; delicious as game.

Every one who partakes of the wild rice must, I think, prefer it to any other. Each grain contains twice or three times as much as the Carolina rice; it is sweet, appetizing, agreeable food; one wants it at any time, and cooked in any fashion. Camp fare, which includes wild rice, will increase a man's weight at the rate of a pound a day, and when the rice crop fails Indians are thin. A great deal of the quantity matured is not gathered; it goes to waste and is eaten by birds and animals. It takes no trouble to grow, requires no cultivation, and is simply an article of food which it is desirable to place at the disposal of the human race; and it deserves attentive consideration as an important food plant. I was interested to note that this grain is to some extent affected with *ergot*, like rye. In the grain prepared for use by the Sandy Lake Indians, the *ergoted* grains are found in the proportion of half a pint or less to the bushel; some of them are left upon the stalks when the grain is gathered. They are, however, of usual occurence, as attested by the fact that the Indians have bestowed on them a special name due to their appearance, and signifying "the rice-harvest bird," which is what they call the Sora Rail. I do not know whether the *ergot* is found on all rie-fields, or if it possess medicinal properties. Some of it is in the hands of Professor H. C. Ward, Jr., of the University of Pennsylvania, who will doubtless give it the attention it merits.

If anything above is of interest to your readers, you may make use of it if you have space. I hope *you* will find it so, at all events, and remain

Yours, truly, C. H. BAKER.

MARTINDALE CONSERVATORY AND GREEN HOUSES, July 18, 1879.

MR. L. B. CASE, RICHMOND, IND.—*Dear Sir:* Your postal received. Dr. E's letter to me I received some days ago, and in answer wrote him that what I took for seeds were actually young plants growing on the stem; all I had to do was to set them in a propogating bench like Tuberoses, and they formed roots right off. I send some of the seeds to you with this. Have several hundred plants growing. I put some flowers in alcohol, which the Doctor can have if he can make use of them.

Yours Truly, CHAS. BECK, Chief Gardener.

[The above note from Mr. Beck was in regard to the *Furcræa Gigantea*, page 43, July number of the BOTANICAL INDEX, 1879, and adds to the knowledge of this peculiar plant.—ED. BOTANICAL INDEX.]

LEESBURG, SUMTER COUNTY, FLORIDA, July 2d, 1879.

MR. L. B. CASE.—*Dear Sir:* The July number of the BOTANICAL INDEX just received. With this I forward a plant called here *Paint root*, which grows either in the water or near the water, on wet and mucky land. It sprouts in early spring, and blooms the last of June or July. It puts on its first root or tuber after it blooms, like the sweet potato. Hogs are very fond of the root, and where they can get it plentifully, fatten very rapidly on it, and frequently, founder and lose their hoofs; it makes firm meat and lard, and is very sweet, but the meat is colored pink, like the root. I also forward a specimen of plant called *Sweet Beggarlice*, (probably *Bidens leucantha, Willd.*—ED.) While young is a very tender, sweet and nutricious plant. Horses and cattle eat it in preferance to any other grass or clover, and fatten on it rapidly. When cut while young before it seeds, it makes good hay. It drops its seed in the fall and comes up the following summer after the corn crop is laid by. It grows

from 3 to 4 feet high on very thin land, and from 6 to 10 feet high on free sandy land; will grow upon any dry land, but delights in a free sandy soil. I also send a very ornamental fragrant plant, found on the poor sandy land here called the Vanilla plant, (*Liatris odoratissima, Willd.*—Ed.) which is quite desirable for its rich vanilla-like perfume.
Yours Respectfully,
MAT. COLEMAN.

ALHAMBRA, MADSON CO., July, 1879.

L. B. CASE.—*Dear Sir:* I send to you a leaf, bud, flower and root, of a plant I found growing wild in a pond near the city of Alton, which I wish you to name. I take it to be the plant described in your second paper on Water Lilies. There was as much as one acre of these plants. Some of the leaves measured twenty inches. The pond had dryed up and the mud was hard on top. I dug a few roots with a stick, with much work. The locality is twenty miles from my place; I discovered them last Saturday, while traveling on the road. If you can send me a first paper on Water Lilies, do so.
Yours, respectfully,
W. W. ELLIOTT.

[The plant came to hand in due course of mail and proved to be *Nelumbeum latum, Willd.*, which adds another locality to our list. We are always pleased to receive such memorandums, and again, would request all who are interested in botany, either as a science or an object of beauty, to remember us when they chance to meet with any unusual plant or form of plant life.—ED. BOTANICAL INDEX.]

ROCHESTER, N. Y., September 20, 1879.

L. B. CASE.—*Sir:*

The seventeenth biennial session of the American Pomological Society was held at Rochester, N. Y., September 17, 18 and 19, in the Common Council Chamber; the society made the exhibition of fruit at the grounds of the Western New York Agricultural Society, having been invited to meet with this society on the occasion of the annual Fair. A large tent was put up exclusively for the exhibit of the National Society, and was well filled with fruits of various kinds, the perfection of which charmed the beholder into the belief that the garden of Eden had produced them. The society does not award premiums, but the honored President, Marshall P. Wilder, has endowed the society with the Wilder medals, which, as the report will show, was received by several societies and individuals, among them being the father of the gift himself. The Committee on Fruits reported through their Chairman, Mr. Berkman, that there were on exhibition 859 plates of apples, 517 plates of pears, 16 plates of peaches, 409 plates of grapes, 37 plates of miscellaneous fruits; aggregate, 1,838 plates.

The father of the society, Hon. Marshall P. Wilder, who is now 82 years of age, was not present, being detained by failing health. Dr. John A Warder, Vice President for Ohio, presided the first day, after which Patrick Barry, of Rochester, who was elected First Vice President, occupied the chair. A formal reception was given the society at the first meeting by way of an address of welcome by Hon. C. R. Parsons, Mayor of Rochester, an effort worthy the occasion and the speaker. The address of President Wilder, considering the age and ill health of the writer, is a remarkable production, full of vigor and strength, yet alludes in a touching manner to the inevitable end of this life which soon must come to the writer. Dr. Thomas P. James, who has been Treasurer of the society ever since its organization, was also absent, owing to failing health, and for that reason resigned his office. The officers for the biennial term are: President, Hon. Marshall Pinkney Wilder, Boston. First Vice President, Patrick Barry, Rochester, N. Y., and one Vice President for each State and British Province. Treasurer, E. W. Buswell, Boston. Secretary, Robert Manning, Salem, Mass.

The discussions on Fruits, in which were included statements relative to new varieties, and various other matters of interest to pomologists, were entered into with much spirit and occupied a good share of the time. Learned and interesting addresses and papers were submitted; among them was "Sexes of Flowers in relation to the fruitfulness of Orchards and New Varieties," by Prof. Thomas Meehan, of Germantown, Pa.; "Distinguishing Varieties of Apples by the Flowers," by Prof. William J. Beal, of Lansing, Mich.; "Grape Rot in America," by Isidor Bush, of Bushberg, Mo. In addition to the routine business, the society made lighter its labors by the accustomed banquet. This was an exceedingly elegant and enjoyable affair. The society received and accepted an invitation to a reception at Powers's

Art Gallery, given by Mr. D. W. Powers, a gentleman whose public spirit and hospitality is in keeping with his wealth and aesthetic tastes. After passing through the various apartments, lost in admiration of works of art, the company was summoned to an upper room, and we were even more delighted, if that were possible, with the scene which met the view. It was nature's perfect work of fruits and flowers. The arrangement was so artistic that it was hard to tell which was the more perfect, art or nature. The centre of the hall was occupied by a table which extended nearly the entire length. It was ladened with fruits and flowers, and illuminated like an enchanted scene. The honored guests were escorted to seats at small tables by the gentlemen in attendance, after which came the invocation, and then the *menu*. And this was the "Feast of the Goddess Pomana, at Powers's Art Gallery," as the programme stated, and it was "a feast fit for the Gods." After this feast, came "the feast of reason and the flow of soul," in form of toasts and responses, which I only refrain from giving because this article has already grown too long, even in this meagre sketch, which is only an outline of the proceedings of the society, which is composed of many of the most prominent pomologists in the United States and British Provinces, and is the most noted pomological society in the world.

H. V. A.

RECENT PUBLICATIONS.

Yes, we love good, instructive books, and always greet them with a hearty welcome; for we are never so tired or busy that we cannot devote some time to their perusal, and then, it is such a relief and pleasure to drop all thoughts of business, even for a short time, and learn from the experience, observation or investigation of others.

First and most important of all the books issued of late, is Prof. Asa Gray's *New Botanical Text Book.* Part 1: Structural Botany; 442 pp. New York. Ivison, Blakeman, Taylor & Co., $3.00. This is its sixth edition, and has been entirely rewritten, and many new illustaations are added to the already ample supply. This volume is devoted to the structure of the plants, the various shapes their parts assume, and the relations of their various organs to one another. Probably no man living can convey the same ideas in so few words as Prof. Gray, and while his writings are strictly scientific, they are so plain that no one with any knowledge of the subject can fail to comprehend its meaning. And added to his clear and comprehensible style of writing, is the fascinating manner with which he leads you along in some of his smaller books, particularly in How Plants Behave. The first edition of this work was published in 1842, and the fifth in 1857, both editions being complete in a single volume, but now it requires four volumes to complete the subject, as the additions to the knowledge of botany have made such enormous strides since 1842. It has been Prof. Gray's good fortune to gather around him some of the best scholars in America, and in this great work he has assigned to Prof. Goodale, the distinguished experimentalist and teacher, the task of preparing the second volume, (now in course of preparation, Part 2, Physiological Botany, Vegetable History and Physiology.) The third volume (Part 3, Cryptogamic Botany, structural and systematic,) is assigned to Prof. Farlow, and will be devoted to flowerless plants, viz: Ferns, mosses, sea weeds, fungi, etc. While the fourth, and concluding volume, (Part 4, Morphology and economic use of the natural orders of Phaenogamous Plants,) will be the special work of Prof. Gray, who, we all earnestly hope may live to enjoy it as the masterpiece of a studious life. It would be unnecessary for us to say that this work should be in the hands of every botanist, but earnestly request all our readers to procure a copy, if they have not already done so, of this as well as all of Prof. Gray's valuable books.

Report of the U. S. Geographical Surveys, under Lieut. G. M. Wheeler, U. S. Engineer, Vol. 6; Botany, by Dr. J. T. Rothrock, is an indispensable work to the student of our Western Flora. It is a companion to Sereno Watson's hitherto unequaled report on the Botany of Clarence King's Surveys. It is a large quarto volume of over 400 pages and 30 lithographic plates, of plants peculiar to the region west of the Mississippi River. In addition to the work done by Prof. Rothrock, he was assisted by ten specialists, all eminent in their studies.

Ferns and Flowers of the United States.—Thos. Meehan has now finished Vol. 2, which for lack of patronage is suspended, but we hope only temporarily, for of all the choice and entertaining popular works this was the first.

A Popular California Flora.—By Volney Rattan, San Francisco, published by A. L. Bancroft & Co. The flowers of California have been described in so many different and generally inaccessible works, that it is no little trouble for any one to learn the histories of the plants he finds. In this only the polypetalous and gamopetalous exogens are described, and of these the umbelliferæ and compositæ are ommitted. Still it is the only cheap work accessible to students of the California flora, and is therefore valuable so far as it goes.—*Gardener's Monthly.*

In the way of specialties we have Sereno Watson's Revision of the North American Liliaceæ, a most valuable addition to one of the most interesting families of plants.

Characeæ Americanæ, by Timothy F. Allen, M. D., No. 10 East Thirty-sixth street, New York City, is a large quarto work, issued in monthly parts, at 25 cents each; five parts for $1.00; each part is illustrated with a finely colored plate. This is a strictly scientific work on one of the most interesting families of aquatic plants.

But equally as instructive is Baron Ferdinand Von Mueller's "Native Plants of Victoria," (Australia.) Scientific men usually are great workers; but few we fancy get through so much as Baron Von Mueller, the Government Botanist, of Melbourne, Australia. This time it is a valuable work, in cheap form, of the native plants of Victoria, comprising all known from Ranunculaceæ to Polygonaceæ, profusely illustrated, and so well described that any one with the rudiments of botany can easily make out an unknown plant. The work is evidently intended for the "people," as there is an evident care to avoid all "hard words" except when certainly unavoidable.—*Gardener's Monthly.*

Wonders of the Flora, by H. Acosta Kresken, Dayton, Ohio, 12 mo., $1.50. This is one of the most valuable hand books published. But its title does not convey the full import of its contents, for although he gives many pages to the beauties and wonders of flowers, he also gives a valuable treaties on the art of preserving flowers with their natural colors. His chapter on the art of making wax fruit and flowers is not only valuable to the amateur, but shows a thorough knowledge of the subject. He has treated the subject of ornamental grasses and mosses and their uses with a great deal of enthusiasm, while his directions for collecting butterflies and other insects will be studied with interest by many young collectors.

The California Horticulturist is a capital monthly, of thirty pages, full of useful information relating to the productions of the Pacific coast; published at San Francisco, at $2.50 per annum.

The Canadian Horticulturist (see Horticultural Directory,) contains the reports of the Fruit Growers' Association, of Ontario, and is a valuable publication for fruit growers everywhere.

The following report of prizes awarded at the American Pomological Meeting was inadvertently left out of our Correspondent's letter:

"We make the following awards of the Wilder medal, and have our action on the precedent established at former meetings of this society:

1. For the largest and best collection of apples exhibited by a society—to the Iowa Horticultural society, a silver medal.

2. For the largest and best collection of apples exhibited by an individual—to E. Moody & Sons, of Lockport, N. Y., a silver medal.

3. For the largest and best collection of pears exhibited by a society—to the Missouri State Horticultural society, a silver medal.

4. For the largest and best collection of pears exhibited by an individual—to Ellwanger & Barry, of Rochester, a silver medal.

5. For the largest and best collection of grapes exhibited by an individual—to F. S. Hubbard, Fredonia, N. Y., a silver medal.

6. To the Hon. Marshall P. Wilder, Boston, for a collection of pears, a silver medal.

8. To J. H. Ricketts, Newburg, N. Y., "Lady Washington" grapes, a silver medal.

9. H. E. Hooker, Rochester, for collection of grapes, a silver medal.

10. To the Missouri State Horticultural Society, for collection of grapes, a silver medal.

11. To Fruit Growers' Association of Nova Scotia, for collection of fruits, a silver medal.

12. To Ellwanger & Barry, Rochester, for a collection of grapes, a silver medal.

13. To the Michigan State Horticultural society, for a collection of fruit, a bronze medal.

14. To W. B. Batcham, Painesville, Ohio, for peaches, a bronze medal.

Owing to the incomplete condition of the exhibits, your committee may have overlooked some meritorious fruits that would otherwise have been noticed."

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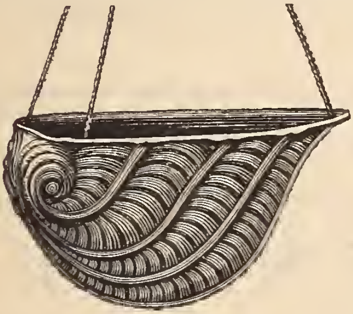

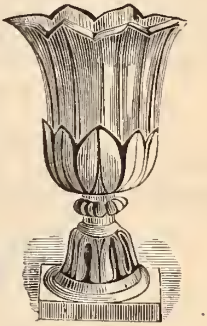

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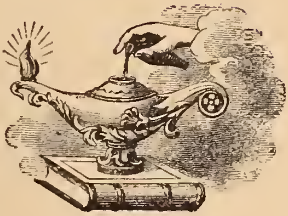

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RICHMOND, INDIANA.

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VOL. III. JANUARY, 1880. No. 1.

L. B. CASE'S
BOTANICAL INDEX

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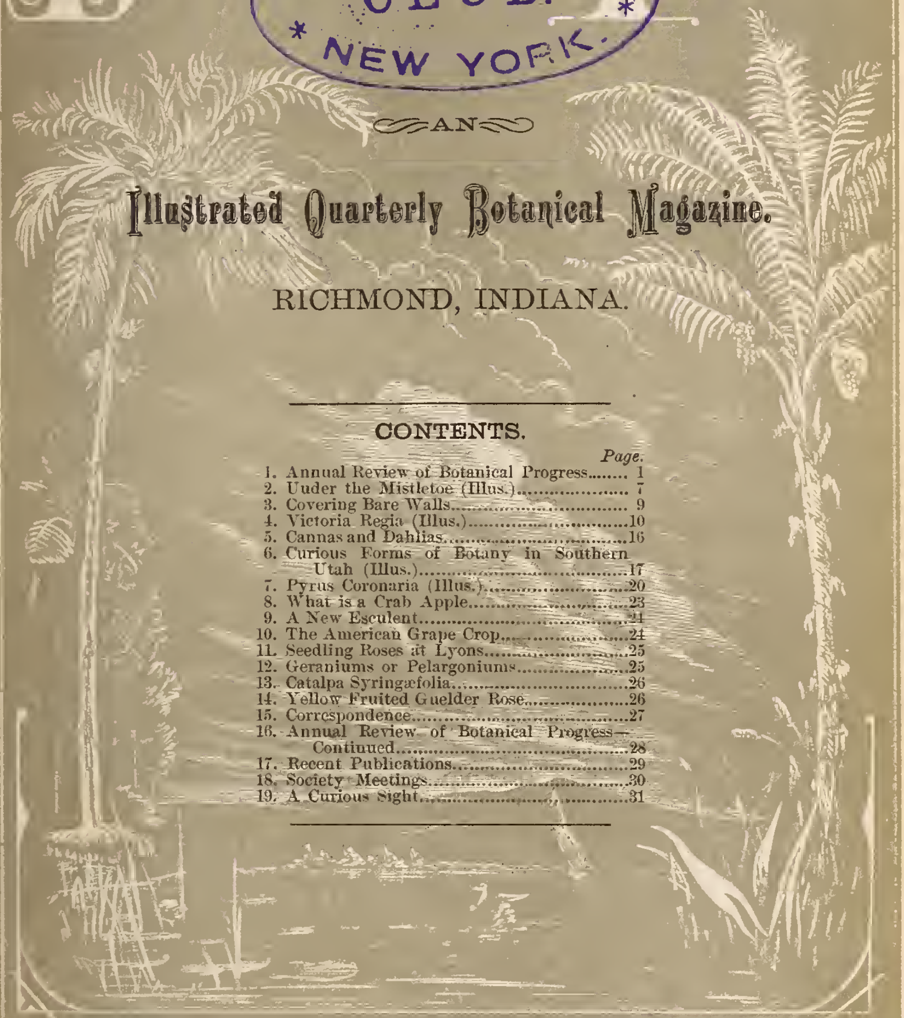
AN

Illustrated Quarterly Botanical Magazine.

RICHMOND, INDIANA.



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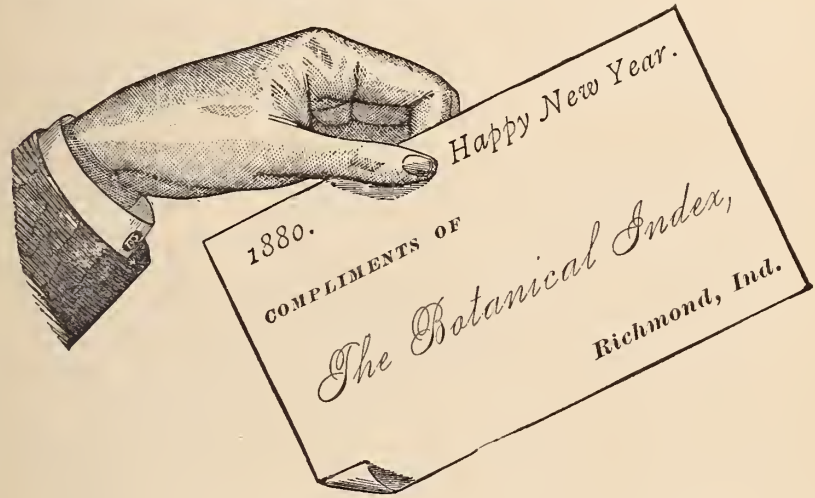
L. B. CASE'S BOTANICAL INDEX

AN ILLUSTRATED QUARTERLY BOTANICAL MAGAZINE.

Vol. 3.—No. 1. RICHMOND, IND., JANUARY, 1880. {Published Quarterly, at 50 Cents a Year.

TO ALL OUR FRIENDS, GREETING:



ANNUAL REVIEW OF BOTANICAL PROGRESS.

PERHAPS we cannot commence the third volume of the Botanical Index in a more appropriate manner than by a review of the benefits received; as well as a summary of what has been accomplished to advance our knowledge of the vegetable kingdom during the year 1879. In considering this subject we must use the word "*Botany*" in its broadest sense, and treat of the subdivisions: Agriculture, Horticulture and Floriculture, under their respective heads, but only as a part and parcel of the great vegetable kingdom, *i. e.*, Botany. First, let us say, we are extremely thankful for the privilege of recording the fact that the past year has been one of unsurpassed fruitfulness to the American Farmer in general, who has not only been favored with an almost unprecedented yield in nearly all the crops, but has also been favored with good prices for the same, which is an unusual occurrence for the agriculturist in any portion of the world. According to the Reports of the U. S. Commissioner of Agriculture, we learn that the estimated yield of the three most important crops for 1879, within the United States, are: for wheat, 425,000,000 bushels; corn, 1,300,000,000 bushels; cotton, 5,000,000 bales, of 400 pounds each or about 2,000,000,000 pounds.

Perhaps, in this connection, it may be interesting to add a summary of our exports, for the year ending June 30th, 1879, as condensed from the Reports of the

United States Bureau of Statistics, for the American Agriculturist, which will convey a better idea of the agricultural wealth of the country than anything we can present. It reads, when computed in money values, as follows:

Grain and Grain products	$282,546,157
Cotton	161,196,178
Tobacco	25,157,365
Pasture products, (including Meats and the Dairy)	38,524,861

This is largely the crops of 1878, as the crops of 1879 are, to a large extent, still in the country and can not be forwarded for several months yet, at least, to any great extent. These figures represent the staples, but in looking over the list we miss many prominent articles, such as fresh and canned fruit, jellies, alcohol, oil, resin, turpentine, vegetable fibre for cordage, seeds, including oil cake, and cabinet lumber, all of which are the direct products of the vegetable kingdom, and produced mainly by the American farmer.

These good crops following years of small ones, together with years of a general depression in all branches of industry, at least in America; with a system of uncertain money values, and an uncertain foreign demand for any of the surplus crop produced, have conspired to make the industrious American agriculturists the most independent class of people in the country, if not in the world. It would be a pleasure to be able to say as much for the farmers everywhere, but unfortunately in some of the more densely peopled portions of the Old World, floods, drouths, early and late frosts, with many other causes have, in many localities, reduced the agricultural class to the most abject poverty, so that the problem of life is to them, and indeed to the government under which they live, a matter of serious study.

The Horticulturist has not, in all instances, shared the same blessing of a large crop, at least in as full a measure, but their average yield, with their usually high prices, have netted the producer for his small crop about as much money as he often receives for a larger one. It is a notorious fact, in America at least, that when any one kind of business is found to be remunerative so many engage in it that the supply produced is so much in excess of the demand that it soon bankrupts all engaged in it. We cannot, however, see any danger from the fruit growers producing more of a supply than the country (and city) demands, at least for a long time to come. We admit a large supply of fruit will lower its market price to a certain extent, but the present very complete system of canning and preserving all kinds of fruit in large quantities, together with the great demand for canned goods, both at home and abroad, will obviate any glut of the market. Of course we understand that there are an innumerable host of fruit growers springing up in all parts of the country, and that a large portion of the families living in large towns and small cities are utilizing a portion of their grounds or yards as a fruit garden, still, as a rule, they do not raise enough for their own use, and the increased desire for fresh fruit constantly creates an increased demand. It is quite probable, however, that the large producers, who have always been very careful to send nothing but the best to market, will to a large extent control the retail market, especially in the large cities, and smaller producers will be compelled to look to the large canning and preserving establishments for their markets, but these will always spring up whenever and wherever opportunity offers.

Unlike the greenhouse business, the fruit-grower is at no expense for fuel to keep his stock from freezing during five or six months of the year, and if he exercise only ordinary skill in cultivation, he can with a judicious selection of the best old varieties, produce as desirable fruit as many growers will often get from a majority of the new and expensive kinds. We do not wish to discourage any one from growing new fruit, but as a rule the experiment, with the mass of cultivators, will prove a failure with only ordinary culture. It is almost impossible for any one to keep themselves informed of all the new varieties of fruit produced each year, and a list of new plants would fill a large volume. Nearly all are produced by hybridizing, but a few are careful selections improved by cultivation. Upon our table now is a list and description of 14 new varieties of grapes, 9 new varieties of strawberries, 13 new varieties of raspberries, while new peaches, pears, apples, plums, &c., appear in nearly all Horticultural journals for 1879. Some of these will, with good cultivation, still retain their superior qualities, but the majority will soon deteriorate into their normal condition. As a rule it is always safe for the practical fruit grower to plant for cultivation only those that have been thoroughly tested. But it is often a great satisfaction to have something new and scarce growing on a place, and to those we would say, "try those that originated near you or in a climate and soil as near your own as possible, in preference to those from a long distance away." The reason is obvious. If a strawberry, for example, originated in the cool, moist climate from near the ocean or great lakes, it would be sure to suffer from the long continued hot and dry atmosphere of the Ohio and Mississippi valleys. This will perhaps explain, at least in part, why so many new and highly recommended varieties of fruit prove so unsuccessful to many of our Western fruit growers.

The Floriculturist does not seem to have been benefited as much by the improved financial condition of the country and the benefits arising from the sale of large crops as the two preceding classes of producers, and as their present very unsatisfactory condition is so peculiar, we will devote a few moments in studying their case. Many causes are assigned for the gradual falling off in their sales each year but (1) perhaps none is more perceptibly felt than the determination of most of our wealthier citizens to economize, and of course all luxuries must be cut off first. This includes the small outlay annually devoted to decorating the lawn and flower garden, together with an occasional purchase of a few flowers to brighten up the home; and as the small contributions of the many is what makes up the sum total of the florist, we see very readily one great reason for the decline in business. (2.) Another potent reason, is the great number of plant and tree producers who have over reached, as it were, in their desire to do a good business, and each year have fell short a little of meeting their current expenses; all these, as a result, must, sooner or later, close out their business, and when they do, their stock is usually sold for what it will bring, regardless of its worth or cost. (3.) Again, in all large towns, there are a large number of market gardeners who, with a small greenhouse and a few hot beds, skillfully handled, can produce, without any extra expense, a large quantity of all the commoner kinds of plants, which are also the popular varieties for house or garden culture; and as their time does not seem to be of any special value to them, (for this work is done when there is nothing else to do,) they can place on the market an immense stock, that must be sold at some price, which is usually much less than it would actually cost a regular grower to produce.

Now, all practical florists know that the ratio of cost between heating and operating, say three greenhouses and twenty, is always in favor of the larger number; or, if it costs six dollars to produce one hundred plants in an establishment of twenty houses, it would cost at least ten dollars to produce the same in a small establishment of only three houses; provided, of course, all the houses have been constructed on the most approved principle, both in reference to fuel and heat, or convenience and economy of labor. Let us now apply the foregoing facts to the whole class of plant producers, and the conviction at once presents itself, that the outlook to the florist of limited means, in America, is most discouraging for a successful business future; for it will hardly require any great foresight to see the result of this system of doing business, must end in the retirement from the trade, of all those who employ from one to five men and heat from 500 to 5,000 square feet of glass, and in a small way now are doing a prosperous wholesale business. We think it is plain to be seen that the wholesale plant business (which is the only desirable part of the business) will soon pass exclusively into the hands of a few careful and large propagators, who employ from twenty to forty, or more, men, and heat 5,000, and upwards square feet of glass; and they will supply all our retail dealers in towns of from 12,000 to 20,000 inhabitants with small plants, in February, March, or even April, at very much lower figures than it will actually cost to heat the houses during the three preceding months. A careful study of the business has convinced us that one person with one or, perhaps, two small houses, of about 500 square feet of glass, can supply the entire wants of people in towns of 20,000 inhabitants, or less, and by hard work and economy can make a fair living, but there the profit will end.

Perhaps we should make an indefinite point a little more clear, by saying the title of florist does not belong to the plant producer, but, correctly speaking, rather to the retail dealer in cut flowers, whose trade being almost exclusively in bouquets, floral designs, or even cut flowers, depends upon his ability to build up a trade, by making friends and customers and holding them. Only a small portion of these florists grow enough flowers during winter to meet their wants, but purchase their supply from some of the large wholesale producers.

But we are pleased to note the fact that if the plant grower does not seem to prosper in his business, and each year his sales grow less, it is not because our people are insensible to the beauties of choice trees, rare plants, exquisite ferns, or strange and lovely flowers; but, rather, they prefer to spend a day, or even an occasional hour, in some of the public gardens, squares or parks, where not only all these desired objects are collected together in large quantities, but added to their numbers is the wondeful effect of systematic, scientific (if you please) grouping. This we call landscape gardening, and very much regret so small a portion of our people seem to appreciate its wonderful beauties. Undoubtedly a cool, fresh and invigorating air, with pleasant drives and walks, are indispensable to the full measure of enjoyment in these public resorts; still, the trees, shrubs and plants are the special objects of interest, and a carpet of soft green grass is the indescribable delight of the almost helpless children or invalid. It may be interesting to our readers, to know how much it costs our large cities to maintain and improve these public grounds, which have become a public necessity in all large towns, and must be maintained and increased each year at public expense, to meet the growing demand for health and comfort. In examining the different items of expenses we shall soon learn that the amount paid for trees, plants and seed, is only a small item in the bills; but the same must also be said of the expenses of the florist, for his chief outlay consists in what his labor and fuel costs him. We should say in this connection that some of the finest examples of Landscape Gardening in America, are probably some of our most noted cemeteries; and we very much regret our inability to give the amount paid by different corporations to make these Cities of the Dead lovely as well as dear to us. We have, however, given enough in the following tables to form an idea of the magnitude of the undertaking.

Amount paid by the City of Boston and County of Suffolk, Mass., to maintain and improve their public grounds, for the fiscal year, ending April 30th, 1879:

General expenses, including salary, office rent, &c	$ 9,954.26
Cost of 35 old parks, gardens, squares and the Common	39,475.53
Back Bay Park, (new)	48,637.52
West Chester Park, (new)	6,291.35
Park nursery, located on Austin Farm, (City Almshouse)	2,000,00
	$106,358.66
Also to maintain 16 old public cemeteries	3,736.97
To maintain and improve 3 new ones, viz: Evergreen, Mount Hope and Cedar Grove cemeteries	37,908.28
	$41,645.25
Making a sum total of	$148,003.91

Paid to maintain and improve public grounds, exclusive of the cost of land.

Amount paid by the City of Chicago, for park purposes, for the fiscal year, ending March 31st, 1879:

For improvement of Lincoln Park, (exclusive of cost of ground,)	$ 70,518.59

Amount paid by the Corporation of St. Louis, Missouri, to maintain and extend their public grounds, for the year ending April 7th, 1879:

Amount paid for saleries, office rent, &c	$ 6,072.47
To maintain 16 old public parks, squares and gardens	59,255.11
Tower Grove Park, under control of Henry Shaw, Esq	25,000.00
*La Fayette Park, under control of special commissioners	12,000.00
Making a sum total of	$102,327.59

(*This is a very low estimate, for it oftener costs $20,000.00 than $12,000.00.)

Amount paid by the City of Baltimore, Md., for park purposes, for the year ending December 31st, 1878:

To maintain and improve 16 public Parks, Squares, &c	$145,579.85

[NOTE.—In addition to the annual appropriations for park purposes, a large revenue is obtained from fines, rents and dues from the several street railway companies, which by law is given to the park commission, and as the fiscal year ends Dec. 31, we could not give the cost for 1879, but in its place give the expenses for 1878.]

So much for the benefits received from the vegetable kingdom, during the year just ended; but as we have already dwelt longer upon this subject than time and space seemed to admit of, we will now briefly see what has been done to increase our knowledge in botany. We must first say, however, that for various reasons we have not been as successful in collecting information as we had anticipated, still a summary of the facts and figures at hand, may be interesting as well as instructive. It has been the usual custom of the United States government to appoint a botanist, or, as in several instances, to detail a competent surgeon from the Regular Army to act as botanist, in addition to their other duties, with the different exploring and surveying parties in the field during summer, and their reports on their collection, when properly worked up, are among the most valuable contributions to American botany. This year, however, there has been none so employed, but this deficiency has been well supplied by private individuals botanizing on their own account, paying their own expenses and profiting by whatever good fortune they happened to meet with. First, perhaps, the tour of Prof. Asa Gray and party, consisting of Prof. Asa Gray, Mr. W. M. Canby, of Delaware, Mr. J. H. Redfield, of Philadelphia, Prof. C. S. Sargent, of Harvard, along the Alleghany mountains as far south as Northern Georgia, is the most important of all, and certainly must have been a most enjoyable trip to all. In Florida, A. H. Curtiss and Miss Mary C. Reynolds have continued their explorations and collecting, and have added much of value to our knowledge of the flora of Florida. In Colorado, quite a number of local collectors have added their full share of new things to the catalogue; foremost of which is T. S. Brandegee, a most indefatigable botanical collector. Utah Territory is also equally fortunate in furnishing several zealous collectors, among whom, A. L. Silver and J. E. Johnson lead the list. Nearly all our western botanists, especially the professors and teachers, have devoted most of their summer vacation (1879) to botanizing, and through them much valuable knowledge has been obtained. Prof. J. H. Carruth, of Kansas State University, has continued his annual tours of investigating the flora of Kansas. Prof. M. C. Jones, of Grinnell College, Iowa, has also accomplished an extended trip through Colorado, Utah and Wyoming, collecting a *mint of knowledge*, as well as herbarium specimens. But the Pacific coast states, however, appear to be the best supplied, in point of numbers, with local collectors of any portion of the country. First, California heads the list with Dr. A. Kellogg, J. J. Lemmon, W. C. L. Drew, S. B. Parish & Bro., W. D. White, J. B. Hickman and Mrs. R. M. Austin. Very much has been done by the above collectors, in advancing our knowledge of botany in California, during the past year, and each day adds still more. In Oregon and Washington Territory, the brothers, Joseph and Thomas T. Howell, and W. Suksdorf, have made valuable collections, and Prof. Gray has immortalized their names in two new genera of plants of their discovery, *i. e.*, the *Suksdorfia* and *Howellia*. Returning again to the eastern coast of North America, we find C. G. Pringle has continued his botanizing in Vermont and Canada, and has been rewarded by unlooked for discoveries. Edward Gillett, E. S. Miller, the Rust Botanical Club, and a score of other botanists and associations, are doing wonders in looking up new or little known botanical data.

We have been compelled to rely mainly upon correspondence for most of the facts contained in this article, (which is a very unsatisfactory mode of collecting information, particularly as so many public officers refuse to send the desired report or information, and entirely ignore our request.) As our correspondence with the officials of the different State Governments has not added a single name to the above list, we must conclude that none of the States have any botanists looking after the Agricultural and Horticultural interests of their respective States in their employ. In the Dominion of Canada, however, we find a government fully alive to the benefits likely to be derived from a more general knowledge of the natural productiveness of a new country. Probably the most important botanical work accomplished during 1879, on the American continent, is that of the Canadian government in connection with the Geological Survey. It may be briefly summed up thus: Prof G. M. Dawson has devoted the summer to exploring in British Columbia, on the eastern slope of the Rocky mountains; Prof John Macoun in the Peace River Country; and Prof. Robert Bell has continued his explorations of the Nelson and Churchill rivers, district of Hudson's Bay. In an Agricultural and commercial point of view, these are the most important surveys probable now in progress in any portion of the world.

Very few people seem to comprehend the importance of studying and noting the experience and observations of the individual members of societies, (under whatever name they may choose to work, either as agricultural, horticultural, scientific or botanical societies or clubs,) and usually recorded in their proceedings or, as is often the case, only preserved in the form of a local newspaper report of the meetings. These are so very important that they should be preserved as works of reference, to imitate or avoid as the case may be. We think the plan adopted by the Fruit Growers Association, of Ontario, Canada, in issuing a monthly magazine (*Canadian Horticulturist*) the best of any, as it continually recalls to the members the fact that some one is busy in the interest of Horticulture. The Montreal Horticultural Society and Fruit Growers Association of Quebec, although only an annual publication, is a valuable guide to the fruit grower, and is a fit companion for the same class of publications issued by the different organizations of the United States.

Our list of botanists in other countries, who are devoting their time to gathering facts and information, is far from complete, but such as it is we give below. Perhaps we should say that Baron Von Mueller and Sir R. Schomburck are Directors of

Government Botanical Gardens, and do not make a business of collecting plants, but they give volumes of information, each year, of inestimable value. Others are traveling as missionaries, commercial agents, &c., and make botany only a secondary study, but it is none the less valuable.

Botanists and Travelers collecting on their own account, (not in North America,) during 1879.

NAME OF COLLECTORS.	LOCALITY COLLECTING.
Dr. Wm. Schimpfer	Abyssinia.
Sir. Richard Schomburgk, Baron Ferdinand Von Mueller, Henry Parcell, Alexander Forrest, Dr. Neidman, Charles Moore	Australia.
E. S. Rand	Brazil.
M. Endres and M. Zahn	Central America.
J. M. Hilderbrandt	Madagascar.
Herr Benedict Roezl	Mexico.
James Dall	New Zealand.
Mr. Pierce	Peru, South America.
Dr. Crevaux, (in French Guinea,)	U. S. of South America.
Rev. Mr. Chalmers, Rev. Mr. Macfarlane, Mr. Goldie	New Guinea.
Mr. G. Maxwell	King George's Sound.
Gustav Wallis	New Grenada.
Mr. Kramer and Louis Boehmer	Japan.

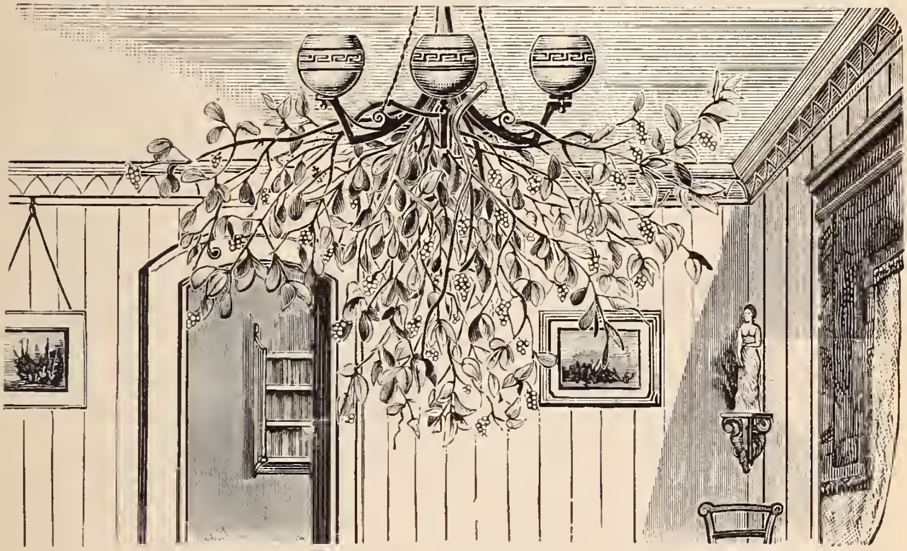
We also add a list of collectors, employed by a few of the large commercial establishments of England. But the list is not complete, because each collector always employs from one to three assistants, while in the list only one is given. Again, in all the portions of the world little known to Europeans, are a numerous class of plant lovers, army officers, &c., who are so much pleased with the vegetable wonders in their vicinity, that they open up a correspondence with some of the famous plant dealers, and, as a result, become plant collectors; these we have designated in the following table as L. C. (local collectors and correspondents.)

	AFRICA	AUSTRALIA AND NEW GUINEA	BRAZIL	CALIFORNIA	CAPE OF GOOD HOPE	CENTRAL AMERICA	EAST INDIES	INDIA	NEW ZEALAND	SOUTH AMERICA	U. S. OF SOUTH AMERICA	WEST INDIES
E. J. HENDERSON & SON	2	......	......	......	......	1	......	......	......	......	......	......
B. S. WILLIAMS	L. C.	1	L. C.	L. C.	L. C.	L. C.	L. C.	L. C.	1	L. C.	1	L. C.
WILLIAM BULL	......	......	......	......	......	......	......	......	......	......	......	......
JAMES VEITCH & SONS	......	......	......	......	......	......	......	......	......	......	......	......
THOMAS S. WARE	......	......	......	......	......	......	......	......	......	......	......	......

It would be a pleasure to notice the addition to our botanical knowledge in the way of new Books, but space will not permit, and we will only say, the year has been productive of some most valuable standard botanical works, in addition to our feast of popular and scientific magazines and journals.

We cannot close this article without a short notice of the inroads made by Death upon the ranks of those who had enrolled themselves under the banner of Flora. Commencing with our own country, we find the names of those enthusiastic Horticulturists: George Cruikshanks, of Mass., Æ. 79; Silas Moore, of Rhode Island;

Robert H. Brownne, of New York city, Æ. 69; Dr. Rugel, of Tennessee, and Dr. M. Ruger, of N. Y., Æ. 44. In England: Rev. Canon Beadle, Æ. 102; Dr. John Miers, (South American traveler,) Æ. 90; Henry Noel Humphreys, (botanical artist,) Æ. 72; Dr. David Moore, (Director Glasnevin Botanical Garden, Dublin,) Æ. 72. In Germany: Dr. F. M. Ascherson, (author,) Æ. 81; Prof. Karl Koch, (horticulture botanist,) Æ. 70; Prof. G. L. Reichenbach, (author,) Æ. 87. In Denmark: Prof. A. H. R. Grisebach, (author.) In France: Dr. Tilbury Fox, (author.) In Italy: Elizabeth, Countessa Florina Mazzanti, (authoress.) In Mexico: Franz Klabock, (traveler and collector,) a nephew of Herr Roezl. In Abyssinia: W. Schimpfer, (traveler and collector,) a class-mate of Louis Aggassiz, who had spent nearly twenty-five years in studying the flora of the country. This list is very incomplete, and perhaps unsatisfactory, but want of time has prevented our obtaining the information necessary for a more complete one. We may add, however, the names of Thilo Irmisch, (author,) E. Spach, (author,) Professors Itzigsohn, Angstrum and Bueck, who have died at different localities of Europe during 1879, and who have devoted their whole lives to studying, investigating, writing or teaching this fascinating study—botany. May their memory always be green and stand as a monument to their names.



UNDER THE MISTLETOE.

BY HELEN V. AUSTIN.

IN the above illustration the artist has given us a faithful picture of the American Mistletoe, for the engraving was made expressly for The Index, from a photograph taken from nature.

"Preparing for the Christmas Party," is the name of a picture which hangs before me. A young lady, as beautiful as Mary, Queen of Scots, is practicing "the minuet" with a little girl; while the musician, dressed in the costume of "ye olden time," seems, even in the picture, producing dulcet strains from the violin, while his eyes are bent upon the child. Above the group, suspended from the chandelier, is a branch of mistletoe, entwined with holly.

Among souvenirs, I have a sprig of mistletoe given to me one Christmas time by a friend, who obtained it from West Virginia. The thick, obovate leaves, that when fresh, were a yellowish-green, are now dry and faded; the berries, that shone in their waxen whiteness, are dim and shrunken, forgetful of their pearly sheen. And yet, this withered memento has a peculiar charm. It is as a key note awakened on a harp of a thousand strings; and mythical lore, and wierd ceremonies, and customs of ancient days, and Christmas times of long ago when the yule-log blazed in the wide fire-place, and kisses under the mistletoe bough, all these and more beside, blend together in a chant, the refrain of which is ever,—"Oh! the mistletoe bough."

The mistletoe (*viscum album*) is a parasitic, evergreen plant. The radicle is peculiar in always turning towards the object to which the plant is attached. The roots insinuate their fibres into the trees and the plant lives entirely on their sap, as the stems and leaves are incapable of absorbing moisture. All attempts to raise the plant from the earth have failed. The name is said to be composed of two Greek words, *a thief* and *tree*, because the plant steals its food from the tree it grows upon. It is a jointed, dichotomous shrub, with sessile, oblong, entire, and opposite leaves, and small, yellowish-green flowers. In the winter it is covered with small, globose white berries, containing each a single heart-shaped seed. The bush is pendent, and grows from two to five feet in diameter. There are about thirty genera and four hundred species. It is stated that in England this parasite grows on about twenty kinds of trees. In ancient Greece the mistletoe was found most frequently on fir trees. At the present day it grows abundantly in Normandy, usually on apple trees, and forms quite an article of commerce. It is sent chiefly to London, being harvested a few days before Christmas, for the English people still venerate the mistletoe bough at Christmas time.

The American Mistletoe (*viscum flavenscens*) grows from Florida to Mississippi and northward, and from New Jersey to Illinois and southward; found most frequently on elms and hickories. It blossoms in April and May. The plant is yellowish-green, the branches opposite or whorled, the leaves fleshy, obovate, and the berries white, waxy and glutinous.

The mistletoe grows not after the manner of most plants. It lives a high and airy life, as though it were "not of the earth, earthy." It establishes a Hanging Garden of its own, and defies the skill and interference of man in his efforts to cultivate it. Surely it is a dainty, dainty plant, sipping only the wine of life from the trees that foster it. No wonder it keeps its leaves all winter and garnishes itself all over with glistening pearls. Yet, the peculiarity of its habits and appearance is not that which alone creates the interest in the "mistletoe bough." It is the romance, the superstitions, the customs, the legends of the past; and we, who love a vein of the romantic wherever found, are glad that science, while it describes this plant in technical terms, cannot take away the ideal and legendary.

Scandinavian mythology gives the sad story of the death of Baldur the Good by means of the sacred mistletoe which grew on the eastern side of Valhalla. By fraud the wicked Loki caused the death of Baldur; a story which Longfellow has made familiar to the casual reader in his translation of Tegner's Drapa.

The mistletoe is celebrated because of its consecration to religious rites and ceremonies by the ancient Celtic nations of Europe. The Druids, who were the priests and magistrates of the people, attached much sacredness to the mistletoe when it was found growing upon the oak, which was a divine tree, according to the Druidic religion. As it was rarely found upon the oak, the discovery of it was the occasion of much rejoicing and religious ceremony. At the time of the winter solstice, the Druids went into the forests, and at the foot of an oak tree bearing the mistletoe, built an altar and performed their religious rites and ceremonies. Pliny says: "They call it by a word in their language which means 'Heal All,' and having made solemn preparations for feasting and sacrifice under the tree, they drive thither two milk-white bulls, whose horns are then for the first time bound. The priest then, robed in white, cuts the mistletoe from the tree with a golden sickle. It is caught in a white mantle, after which they slay their victims, at the same time praying that God would render his gifts prosperous to those to whom he had given it." The mistletoe was esteemed as possessing wonderful medicinal virtues, especially when found growing upon the oak, and it was used as a medicine long after the Druids went the way of all the earth.

Shakespere, in Titus Andronicus, speaks of the "baleful mistletoe," not as that which works an evil charm to mankind, but as that which had o'ercome the trees, as had the moss:

> "A barren, detested vale you see it is;
> The trees, though summer, yet forlorn and lean,
> O'ercome with moss and baleful mistletoe;
> Here never shines the sun; here nothing breeds
> Unless the nightly owl and fatal raven."

In contrast to this picture, is the merriment, and sport, and good cheer, which prevailed when the mistletoe and holly graced the Christmas festivities in "merry England." When under the "white-berried bough," vows were whispered and lips of lovers met, and forfeits were paid beneath the "bough of mirth." But alas! mirth and sorrow sometimes meet when least anticipated. The ballad of the "Mistletoe Bough," is a sad instance of this. Rogers has given a version of the story in his poem of "Genevra," which is more familiar, perhaps, than the beautiful old ballad, which we cannot omit in this connection:

THE MISTLETOE BOUGH.

The mistletoe hung in the castle hall,
The holly branch shone on the old oak wall;
And the Baron's retainers were blithe and gay,
And keeping their Christmas holiday.
The Baron beheld with a father's pride,
His beautiful daughter, young Lovel's bride,
While she with her bright eyes seemed to be
The star of that goodly company.
Oh! the mistletoe bough!
Oh! the mistletoe bough!

"I'm weary of dancing now," she cried;
"Here tarry a moment—I'll hide, I'll hide;
And Lovel be sure thou'rt the first to trace
The clue to my secret lurking place."
Away she ran, and her friends began
Each tower to search, and each nook to scan;
And young Lovel cried, "Oh, where dost thou hide?
I'm lonesome without thee, my own dear bride."
Oh! the mistletoe bough!
Oh! the mistletoe bough!

They sought her that night, and they sought her next day,
And they sought her in vain when a week passed away;
In the highest, the lowest, the loneliest spot,
Young Lovel sought wildly, but found her not.
And years fled by, and their grief at last
Was told as a sorrowful tale long passed;
And when Lovel appeared, the children cried:
"See! the old man weeps for his fairie bride!"
Oh! the mistletoe bough!
Oh! the mistletoe bough!

At length an oak chest, that had long lain hid,
Was found in the castle—they raised the lid,
And a skeleton form lay mouldering there,
In the bridal wreath of the lady fair!
Oh! sad was her fate! in sportive jest
She hid from her lord in the old oak chest;
It closed with a spring, and her bridal bloom
Lay withering there in a living tomb!
Oh! the mistletoe bough!
Oh! the mistletoe bough!

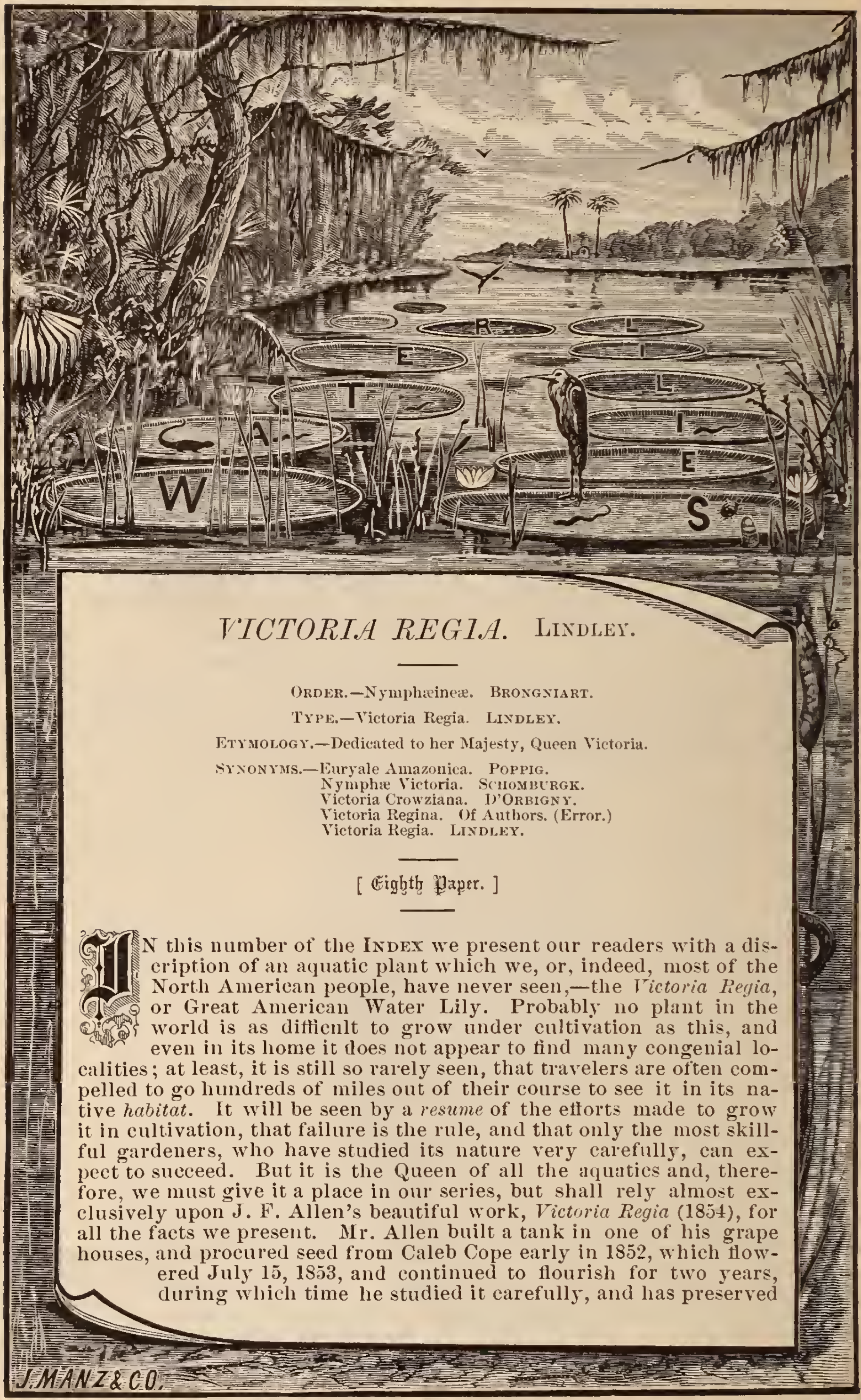
Sir Walter Scott, in his melodious description of the manner in which his "christian sires of old" celebrated Christmas with "domestic and religious rite," makes a pleasing reference to the mistletoe:

"On Christmas eve the bells were rung;
On Christmas eve the mass was sung;
That only night, in all the year,
Saw the stoled priest the chalice rear;
The damsel donned her kertle sheen;
The hall was dressed with holly green;
Forth to the wood did merry men go,
To gather in the mistletoe;
Then opened wide the baron's hall
To vassal, tenant, serf, and all;
Power laid his rod of rule aside,
And Ceremony doffed his pride;
All hailed, with uncontrolled delight
And general voice, the happy night
That to the cottage, as the crown,
Brought tidings of salvation down."

COVERING BARE WALLS.

"I. B.," in the April number of the INDEX, recommends covering bare walls with ferns, orchis, &c. A good suggestion; but when the walls have a southern exposure, I would recommend to those requiring a large supply of cut flowers, to train heliotropes or some of the allamandas on the wall. I find in our cut flower trade we cannot have too much heliotrope for bouquets and baskets especially, and the number of flowers produced on plants grown on the "extension system" is simply immense.

MILTON.



VICTORIA REGIA. LINDLEY.

ORDER.—Nymphæineæ. BRONGNIART.

TYPE.—Victoria Regia. LINDLEY.

ETYMOLOGY.—Dedicated to her Majesty, Queen Victoria.

SYNONYMS.—Euryale Amazonica. POPPIG.
Nymphæ Victoria. SCHOMBURGK.
Victoria Crowziana. D'ORBIGNY.
Victoria Regina. Of Authors. (Error.)
Victoria Regia. LINDLEY.

[Eighth Paper.]

IN this number of the INDEX we present our readers with a discription of an aquatic plant which we, or, indeed, most of the North American people, have never seen,—the *Victoria Regia*, or Great American Water Lily. Probably no plant in the world is as difficult to grow under cultivation as this, and even in its home it does not appear to find many congenial localities; at least, it is still so rarely seen, that travelers are often compelled to go hundreds of miles out of their course to see it in its native *habitat*. It will be seen by a *resume* of the efforts made to grow it in cultivation, that failure is the rule, and that only the most skillful gardeners, who have studied its nature very carefully, can expect to succeed. But it is the Queen of all the aquatics and, therefore, we must give it a place in our series, but shall rely almost exclusively upon J. F. Allen's beautiful work, *Victoria Regia* (1854), for all the facts we present. Mr. Allen built a tank in one of his grape houses, and procured seed from Caleb Cope early in 1852, which flowered July 15, 1853, and continued to flourish for two years, during which time he studied it carefully, and has preserved

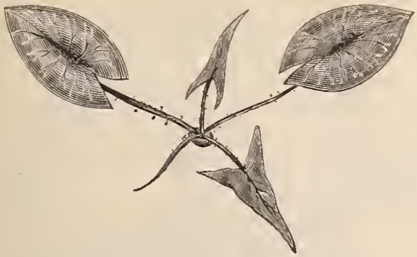


FIG. 161. *Young Plant.—After Allen.*

his observations together with the facts obtained from Hooker, D'Orbigny, Schomburgk and others, illustrated with a series of beautifully colored, life-like lithographs, which is one of the choice gems of American literature. Our illustrations are, also, taken from the same work, much reduced in size.

Let us first review the history of its discoveries by European travelers, as gathered mainly from Mr. Allen's work. In 1801, the Spanish government sent out the botanist, Hænke, to investigate the vegetable productions of Peru, and in one of his pirouge (canoe) voyages, in 1803, with Father La Cueva, a spanish missionary, on the Rio Mamore, one of the great tributaries of the river Amazon, they discovered, in one of the marshes by the side of the river, "a flower so surpassingly beautiful and extraordinary, that Hænke, in a transport of admiration, fell on his knees and expressed aloud his sense of the power and magnificence of the Creator in His works."

In 1819, Amie Bonpland, a French botanist and fellow-laborer of Humboldt, in a voyage down the little river Rio Chuelo, saw from a distance this superb plant, and nearly precipitated himself off the raft into the river in his desire to secure some specimens, and his enthusiasm was so great that he was able to speak of little else for a month. The next year, (1820,) however, he had the pleasure of obtaining specimens of this plant not far from the forks of the Parana and Rio Paraguay rivers, near the town of Corrientės.

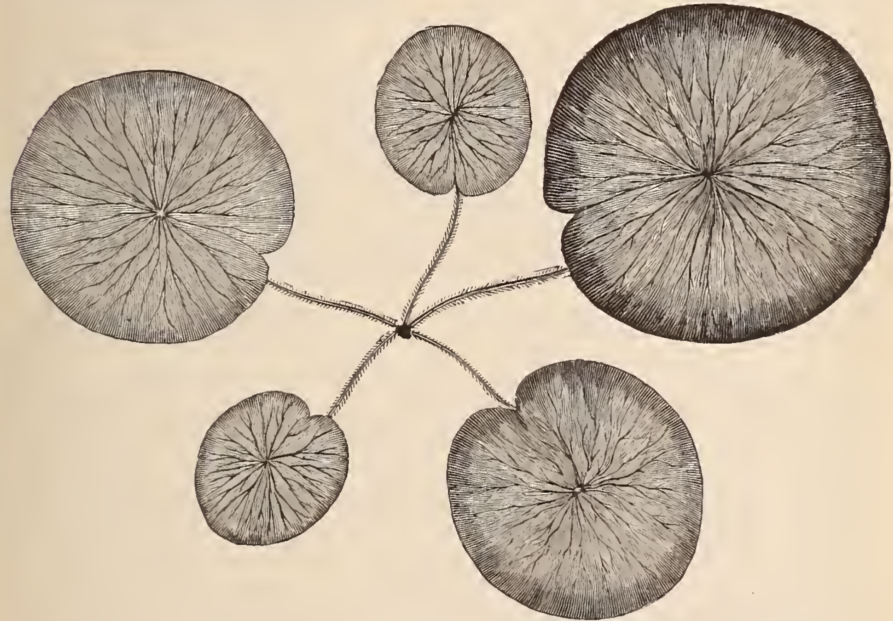


FIG. 162. *Young Plant at the Completion of the Second Cycle of Growth of Five Leaves.—After Allen.*

M. Alcide d' Orbigny was the next European traveler who saw the plant. In 1827, when descending the river Parana in his frail pirogue, and accompanied by two Guarani Indians, and more than nine hundred miles from its junction with the Rio de la Platte, at a place called the Arroya de San Jose, in the province of Corrientes, he observed that the marshes on either side of the river, for a mile, were bordered with a green and floating surface of huge, round and curiously margined leaves, while here and there glittered the magnificent white and pink fragrant flowers.

Dr. Poppig, a German botanist, was the next European to record its existence. After a residence of five years in Peru and Chili, (from 1827 to 1832,) he met with it while descending the Amazon, and was the first one to publish a description of it upon his return to Europe.

In 1837, Sir Robert H. Schomburgk found the plant growing in the river Berbice, British Guiana, one hundred and twenty miles from the coast. Again, in 1842, after a residence of five years, while on an exploring expedition for the Royal British) Geographical Society of London, he again met with it in the Rupununi, an affluent of the Essequibo, British Guiana.

In 1845, Mr. Thomas Bridges found the plant growing in a small lake by the river Yacuna, a tributary of the Rio Mamore, near the town of Santa Ana, in the province of Moxos, Bolivia.

In 1849, Mr. Spruce also found them growing in a lake on a large island, at the junction of the rivers Tapajoz and Amazon, and has given it a more careful and accurate description than any other traveler, and although many travelers have seen it since 1845, they usually came upon it unexpectedly and did not study its character with enough attention to add anything of value to the knowledge already obtained of it.

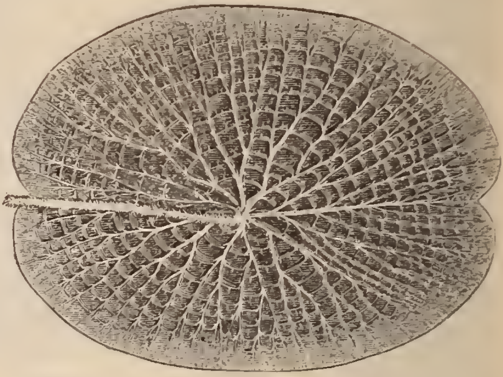


FIG. 163. *Back of Mature Leaf—After Allen.*

As we have said it is such a difficult plant to grow, we must give a brief notice of the efforts at cultivation. Although M. D'Orbigny sent seed to the Natural History Society of Paris in 1827, and M. Bonpland to the Garden of Plants, Paris, in 1835, none of them appear to have been planted; at least, no record is made of the fact, for, indeed, they seem to have been neglected or overlooked for many years. When Sir Robert Schomburgk first discovered the plant, (1837,) he made repeated efforts to introduce living plants into England, but each time failed; however, in August, 1846, Thomas Bridges forwarded the first seed to England that germinated. These seed were packed in a bottle of moist earth, and two plants started, but both plants perished during the following winter. On the 28th of February, 1849, Dr. Hugh Rodie, and Mr. Lachie, of Georgetown, Demerara, forwarded seed to Sir W. J. Hooker, at the Kew Gardens, in phials of pure water, which, upon arrival, were planted in pots of earth and immersed in water and enclosed in a small, glass case with a tropical temperature, which germinated on the 23d of March. A portion of these were distributed to some of the most successful plant growers of England, and afforded the first opportunity for study under cultivation.

The first plant grown in the United States was at Springbrook, near Philadelphia, the residence of Caleb Cope, Esq., in 1851. The next was the plant grown by Mr. J. F. Allen, as already noticed. Since which time, there have been a number grown to maturity, and many more attempts have been made, which proved a failure. At the present writing, the only plant, so far as we can learn of, is in the Water Lily House, of the Golden Gate park, at San Francisco. It has displayed its wonderful flowers to thousands of flower lovers of San Francisco lately, and bids fair to be a source of much enjoyment for some time to come.

As we have given a history of its discovery and efforts at cultivation, it may not be amiss to reproduce a history of its name as given by Mr. Allen. Here we find that "M. Bonpland tells us the natives of Corrientes call it Mayz de l'Agua,—maize, corn or wheat of the water. D'Orbigny says the Guarani Indians call it *Yrupe*,—literally, water platter. We have given at the head of the article a list of synonyms of this species, and will only add here that Poppig described it as a *Euryale*, thinking it generically identical with this genus as presented in the East Indies, but later botanists soon decided it to be distinct. (Generically, *Victoria* is most nearly allied to *Euryale*, but it is distinguished by the deciduous sepals, by the gradual transition in the form of the petals to that of the stamens, by the more numerous cavities of the ovary, and other particulars. The leaf of *Euryale* is, however, an exact miniature copy of that of *Victoria*, save that it is not turned up at the margin.—*Treasury of Botany*.) Dr. Schomburgk considered it a typical *Nymphæa*, and so described it in a letter to the Royal Geographical Society, London, and wishing to commemorate the memory of his (adopted) Sovereign, Queen Victoria, he applied it to his new species as a specific name, to distinguish it from other species of *Nymphæa*. In 1837, John Lindley, Professor of Botany in University College, London, and one of the best authorities on aquatic or marsh plants, first assigned it to its present and correct position in the vegetable kingdom, by proposing Dr. Schomburgk's specific name,

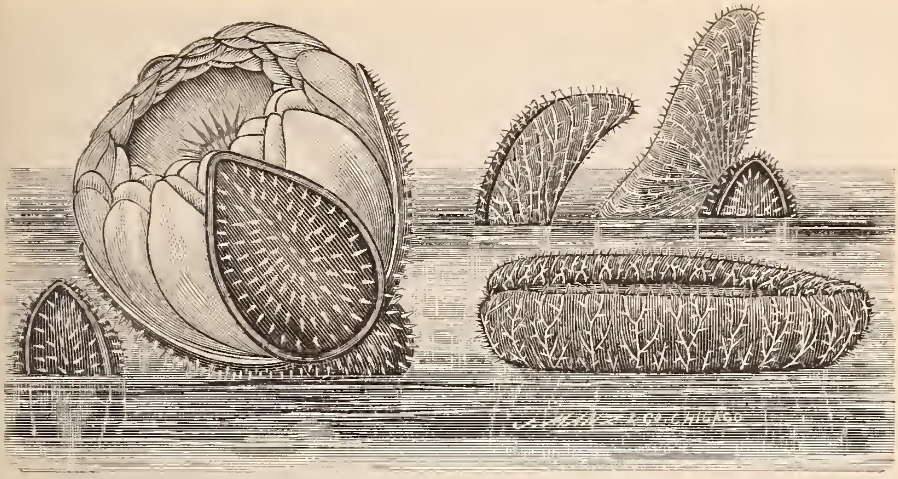


FIG. 164. *Opening Bud and Young Leaves.—After Allen.*

Victoria, as the name for his new genus, at the same time, giving it the new specific name of *Regia*,—not *Regina*, as many authors would have it. We might also add with propriety, that there is only one more recognized species of *Victoria*, viz: *V. Fitzroyana*, (*Nymphœa gigantea*,) of Australia. The most elaborate and complete work on the *Victoria*, is said to be Sir W. J. Hooker's *Monograph*, much of the material being prepared by Sir Joseph Paxton, from observation of the plant given the Duke of Devonshire by Sir W. J. Hooker, and grown at his seat, Chatsworth, but as we failed to precure a copy, we had not the benefit of its pages.

We have taken the liberty to prepare a set of illustrations, mainly from Mr. Allen's *Victoria Regia*, and will now briefly attempt a description of the plant. By studying the root in cultivation, some botanists decide it to be only an annual, or, at least, to grow up from the seed, and, after a brief period of growth, to mature and die. Dr. Poppig was very certain this was the case, and ranged it under the *Euryale;* and many other more recent writers have, to a large extent, adopted his views. It is now, however, decided to be a perennial, which, with a few other distinctive characters, has separated it from all the old established genera, and has been made the type of a new genus. The root is a large, spindle-shaped, fleshy root-stock, marked with the scars of former leaves, and at the base of each leaf is a bundle of many fibrous adventitious rootlets, which often protrude above the surface of the soil; these, when young, are of a yellowish or orange hue. The tuber, or rhizoma, is of a deep red color, and rapidly decays upon the maturity and decline of the plant.

The leaf-stocks are long, cylindrical, and traversed their entire length by numerous air canals, the larger ones arranged with much regularity. The stock is often one inch in diameter, and covered on the outside by stout, sharp, elastic, conical prickles, about three-quarters of an inch in length, which contain spiral vessels and a small cavity at the top. The flower-stock has a similar outward appearance to the leaf and stock, but is stouter and the air-canals are arranged in a different manner. They usually grow in four to six feet of water, and usually have only four or five leaves floating on the surface of the water.

Fig. 161 shows a young plant with five leaves, as grown in Mr. Allen's tank, the first of which appears as a fine blade of grass. The second leaf had a true arrow-shape, like all so-called Water Lilies in some of their stages of existence. The third one still retains the arrow-shape, or, perhaps, more like the Calla (*Richardia*) leaf. Each leaf and stem had increased in size, until the fourth measured, at maturity, four inches in length and nearly two inches in width. The fifth leaf, which appeared twenty-eight days from the date of germination, was still an indefinite arrow-shaped one, and measured four and three-fourth inches in length by two and three-fourth inches in width. This completed the first cycle of five leaves, and was the subject from which the figure was made.

Fig. 162 shows first a small leaf, (the sixth,) nearly round, and measuring five and one-fourth by four inches, while the next in size and age is directly opposite. Each leaf in the series shows the different stages of growth, until the largest or tenth leaf, which is nearly round, completes the second cycle of growth. The peculiar character of the leaf,—the salver-shaped edge, was not developed until the twenty-first leaf had matured, after which all the leaves contained an upright edge of from two to three and one-half inches high. The leaf, when the plant is fully mature, in its native country, often measures from six to twelve feet in diameter, with its margins uniformly turned upwards, but with a deep notch at the two opposite extremes, so that the floating leaves have the appearance of floating trays. They are of a pale green color on the upper face, but of a rich, purplish-crimson tint beneath. The young leaves of mature plants come to the surface in an inrolled condition, and, when unfolding, are exquisitely beautiful, rivaling even the flowers themselves, with their crimson hue. Fig. 163 shows three forms of young leaves in their natural condition before unrolling. The texture of the leaf is very thin and tender, but, by placing a thin board upon its upper surface, a full grown man may stand upon them; indeed, the natives often place their children upon them while gathering the seed, but they lay upon the leaf first a great skin to equalize the weight. Notwithstanding its gigantic size and elaborate structure, the texture of the leaf is so very delicate, that should a straw fall perpendicularly from the height of five feet, so as to strike between the ribs, it would penetrate its substance.

Fig. 163 gives us a view of the back of a mature leaf, which is pellate, and from the stout leaf-stock are eight main ribs, about an inch high, diverging in all directions, giving off numerous smaller nerves, all of which are permeated by air canals and covered with spines. To add to its capacity of buoyancy, numerous arched or curved cross ribs or ties connect the main ribs, and dividing the under surface of the leaf into numerous irregularly quadrangular spaces or cells, giving the leaf the appearance of a spider's web.

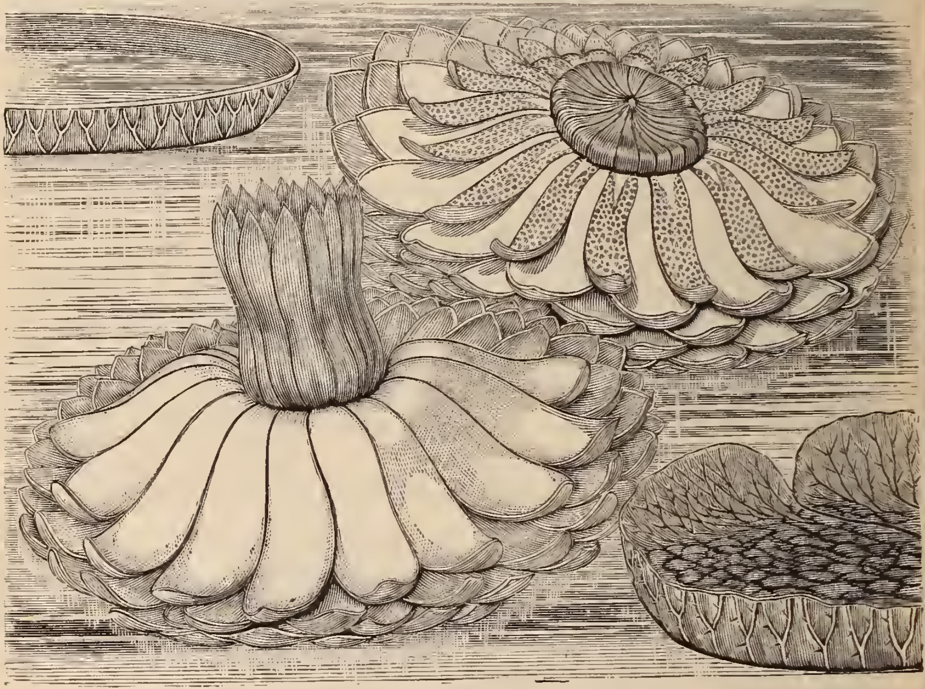


FIG. 165.

The flower stem rises from a scale close by and with a leaf stem, and develops a single flower, the bud of which is pear-shaped and armed with sharp prickles to its summit, which partake of the color of the bud. The four outer leaves (sepals) are often seven inches long by four inches broad; of a deep purple color externally, but fading at the edges into a dull white; white within, and of a thick coriaceous texture. The flower consists of fifty or sixty (many hundred, Schomburgk,) petals, in three distinct sets, in several well defined rows, and, like all other *Nymphæceous* plants, gradually pass into stamens, so that it is often difficult to tell where one begins and the other ceases. The outer petals are from seven to ten inches in length, oblong, concave and white; the inner ones gradually becoming narrower, more pointed, and of a beautiful rose color. The flower rises about six or eight inches above the surface of the water, and a well opened flower is usually about fourteen to eighteen inches in diameter. Their mode of flowering is as novel and interesting as the plant itself. It first opens in the evening a little, when it is pure white and exquisitely fragrant. In the morning it again folds up, and remains so until towards evening, when it again unfolds, but this time it has exchanged its pure white for a deep pink or, sometimes, a rich crimson, or is feathered with crimson or white. At noon the flower again closes, but this time only loosely, and at evening the flower again expands; but now for the last time, and gradually the frail and almost gause-like petals are converted into a flimsy mass, and the flower commences to decay, at the same time withdrawing under the water to rise no more, but to ripen its seed.

It would be difficult to give a satisfactory description of the structure or coloring of this wonderful flower in this short article, but we will try to condense from Mr. Allen's work a description of it. Here the flower in the lower left hand corner is represented as being in bloom on its second day. The outer petals are widely expanded, and show the center and erect ones tinged or spotted with crimson, which remain unchanged until the following noon. The open flower in the upper right hand corner is represented as on the third day, with the petals and stamens all expanded, while the pollen masses has changed the color of the flower to a golden yellow. In the center of the flower is also seen the seed pod, (ovary or torus,) which has now reached its full size. It is globular or top-shaped, depressed at the top or hollowed like a cup, surface granulated, and presenting in the center a little rounded or conical knob from which a great number of lines or furrows radiate to the margin. Along the upper margin of the cup are placed the stigmas, fleshy pointed bodies, somewhat flattened at the sides and bent in the middle so that their points project over the cup towards the center. Each stigma has a prominent line along its upper surface running down to the central knob, which is thus the focus of a series of ridges radiating towards the stigma. The interior of the ovary contains numerous cavities corresponding to the stigma, and each contains several ovules (seed).

The stamens are numerous, the outer ones somewhat lance-shaped, gracefully curved, of a fine rose color, and having two linear anther cells on the inner face, near but not quite extending to the top. Within these fertile stamens are other sterile ones, smaller in size, less highly colored, arching over the stigmas, to which they approximate also in color and form.

Among the many other points of value and interest in the *Victoria*, which is also shared in by a small portion of other choice plants, is the power of the unexpanded flower bud to mature and develop perfect flowers after being removed from the stem. Thomas Meehan tells of an amusing instance of a friend being promised a flower for a wedding festival, but upon the arrival of the appointed time the flower was not there, but to compensate for the disapointment a bud was cut from the stock, packed in a box of damp moss, with a hot brick to keep up the desired heat, and upon arriving at its destination and opening the box, as if by magic a perfect flower was exposed to view. Mr. Thomas Bridges, in his description of the flower, says:—"Those I had collected for preserving were unexpanded, and on arriving at the Governmen House I deposited them in my room, and afterwards, on returning after dark, I found, to my surprise, that all had blown and were exhaling a most delightful odor which at first I compared to a rich Pine Apple, afterwards to a melon and then to a *Cherimoya;* but, indeed, it resembled none of these fruits, and I at length came to the decision that it was a most delicious scent, unlike any other, and peculiar to the noble flower that produced it." Thomas Meehan says:—"A whole house crowded with blooming *Olea Fragrans* would not excel one bursting Lily flower."

The fruit attains, when ripe, the size of a large depressed apple, of an olive brown color, and is covered with prickles. The numerous roundish black seed are imbedded in a spongy substance, (fruit,) and escape by the rotting of the outer portions of the fruit, which always sinks down into the water to ripen its seed. The seed are greenish black, about the size of a pea, oval, and with a slight projection at the upper end. They are farinaceous, milky, and they furnish a very superior flour, which is considered one of the greatest luxuries of equatorial America. They are also eaten by the natives, who consider them a great delicacy after being roasted.

These noble plants inhabit the lagoons formed by the overflow of the large rivers, and also the shallow rivers where there is very little current, in South America; but they are not known to pass beyond a distance of about fourteen degrees of latitude on either side of the equator, or are confined to a strip of country about sixteen hundred and eighty miles wide from north to south, and from east to west a distance of about thirty-five degrees of longitude, *i. e.*, from the Atlantic ocean to the Andes mountains. Their peculiar natural home being directly under the equator, requires a great heat to be maintained where they are grown in cultivation; and also an additional provision for keeping the water in the tank in which they grow agitated, which is usually accomplished by a small wheel moved slowly in the water by mechanical power.

In their natural condition they do not usually send to the surface of the water more than four or five leaves at a time, but under cultivation they have been known to have twenty-five leaves at a time; in a short time they turn yellow and rapidly decay, but are immediately replaced by new ones; but the few leaves completely cover a large space of the surface of the water. Under cultivation it seems to be most vigorous between December and August, reaching its greatest vigor in July, and from August to December the leaves are, as a rule, always smaller and less vigorous; indeed, nearly all South American travelers seem to convey the idea that its greatest glory is from December to August, and in their record of measuring the leaves confirm these views. Sir R. H. Schomburgk says:—"In Guiana, that from March to August they have heavy rains, flooding the whole country and filling the lagoons, but from August to March they have only occasional showers;" which seems to mark out two distinct seasons to correspond with a luxurient and a comparitively dormant period of existence in the *Victoria.*

Unlike all wonderful productions of nature, there does not appear to be any superstitious reverence connected with this plant; indeed, the simple minded natives look upon it as one of the common objects of every day life, and seldom speak of its existence unless questioned about it. M. D'Orbigny, however, says:—"In 1849, when at Rio Pardo, I was surprised to see all the ladies equipped with fans with correct miniature drawings of this *Nymphæa* which I had described twenty-nine years before." As we have already said, the seed are very nutritious, and are a prominent article of food in a few localities of equatorial America.

We cannot dismiss this article without again refering to our selection of the *Victoria* as a subject for the INDEX. We had intended to illustrate and describe as many aquatic plants as possible, under the name of Water Lilies, and, although we had never seen one and had only secured a small amount of information regarding them, we felt that our series would be incomplete without a short article describing them, and in as popular a manner as possible. We have condensed from Allen's *Victoria Regia* and the *Treasury of Botany*, mainly, the facts herein contained, and hope we have not erred in any important assertion here given.

CANNAS AND DAHLIAS.

BY JEAN SISLEY, MONPLAISIR, LYONS, FRANCE.

A GERMAN reader of the *Gardener's Magazine* writes to me inquiring whether the tubers of Cannas must be divided like those of Dahlias. My reply is: Of course, for propagation it is necessary, as there exists no other mode of multiplication. But for the amateur, who desires to have fine and large specimens, he must leave the roots undisturbed, and put them aside in winter as he lifts them from the ground, and plant them next spring as they are. In separating them, he would have the next year but a weakly growth.

The best way of storing Cannas during winter, is in taking them up in autumn, to leave round the roots all the earth which adheres to them, of course cutting the shoots down to about 6 inches, and put them on a floor of a greenhouse, as near as possible to one another: keep them slightly damp, and about March begin to water them with liquid manure; they will then begin to grow slowly if not heated, and plant them as they are, without disturbing the roots, by the end of April or beginning of May, when frost is over.

[Accompanying the above article from our old friend M. Sisley, but included in a private letter was the following information, which we think of so much importance to many of our readers, that, although a portion of a private letter, we have taken the liberty of publishing it. The information was not sent as an advertisement, and the address of the Dahlia grower was not given; however, any one wishing to obtain further information on the subject may direct their communications to M. Sisley, who will take pleasure in handing them to the desired destination.]

I suppose that your Horticulturists import new Dahlias from Europe. I therefore think useful to inform you that one of my neighbors, Hoote, who is the largest grower of Dahlias in France, propagates them very largely and in a peculiar way, to obtain small tubers, fit to be sent per mail, in March, at very great distances, and which make in spring, either in pots or in the open ground, fine plants. The expense of posting is trifling and expeditious. He also grows many other plants, which can be sent by mail. This may, perhaps, interest your readers.

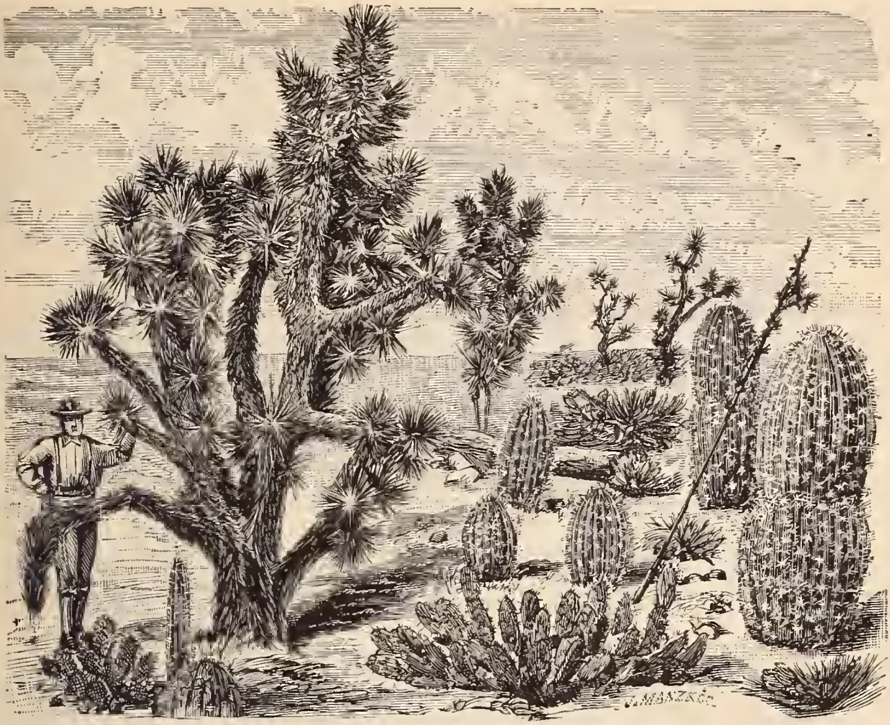


FIG. 166. *View in the Utah Desert, South of St. George, Utah.*

CURIOUS FORMS OF BOTANY IN SOUTHERN UTAH.

BY J. E. JOHNSON, ST. GEORGE, UTAH.

FIRST PAPER.

NATURE is prolific in giving forms strange and varied, in the various altitudes of our mountain climes, and more especially so here, on the partition line, between the heat and cold, so to speak. In our lowest valleys the summer heat raises the mercury for months from 95 to 110° Farhenheit; and from thence one may ride in a day to streams in the mountains, where a harvest of crystal ice may be gathered.

Thus the botany of the antipodes of cold and heat are blended, and vegetable forms congenial to various temperatures become blended and curiously "mixed" and deeply interesting to the lovers of nature. For fourteen years I have watched and studied this page of nature's volume, and spent many pleasant hours at the various seasons of the year, alone and with others, who have visited this region for scientific research. And thinking it possible that some of your readers might also be interested in learning something of our native botany, I will attempt a plain and hurried description of a few of our most notable forms. The family of *Cactus and Yucca* will especially be noted in this, and first

CEREUS LE CONTEI,

The most magnificent, is found among the scoriæ and sand-rocks on the declivities of our mountains, with southern exposure along the Rio Virgen, and grows from one to four feet high and is known among the settlers as "The Nail Keg," or "Devil's Bee-hive;" is twelve to sixteen inches in diameter, and in the distance resembles a stump, with smooth rounded head, but on near approach it is bristling with straight and curved spines, often four inches in length and a sharp point. It is furrowed or ribbed perpendicularly, thus forming depressions an inch or more in depth, the spines forming clusters of rows, in close proximity from ground to top on the outer line of the ridges, which forms a protection against its destruction by animals that would, from hunger or thirst, otherwise destroy it. It is composed of a tender pulpy substance, of about eight-tenths water, the remainder vegetable fibre. The spines are often secured by travelers for toothpicks, while the natives use them instead of pins. The flowers appear in May or June, are about an inch in diameter and two inches long, of pale yellow, orange center, appearing on top in a circle, one on each rib, a few inches from the center, between the clusters of spines; sometimes too such rows of bloom appear each season, followed by dry capsules filled by black, shining, flattened seeds about the size of a cabbage seed. The plant is very attractive in the garden or lawn, and is always approached with exclamations of admiration, and we have often provoked great mirth by observing to visitors, that "it was against the rules of the garden for callers to use it for a seat."

THE COTTON CACTUS

Was discovered by a traveler some forty years ago, and recently re-discovered by Dr. Edward Palmer, (who spent part of four years botanizing in this region.) It very much resembles the *Le Contei* in everything except its size, (which is less,) and that the capsule is filled with a fine staple of cotton. It grows a foot or more in height and is ten inches in diameter, blooms in July and matures its fruit in August.

CEREUS FREMONTEI

Is a very singular plant. From one root there is a collection of single stems, about an inch and one-half through, and the center or oldest parts often fifteen or twenty inches long, all growing in a compact bundle, and tapering to a rounded form, much resembling a small *C. Le Contei*, the clump often sixteen inches through and ten to twenty inches in height. It has a blossom, in summer, about two inches long, of a wax-like half open character, and of an intense dark red color. The plant is well protected with long, sharp spines, and when in bloom is very striking, rich and beautiful.

CEREUS (OR ECHINO CACTUS,) JOHNSONI,

Is a round bristling ball, which I had the honor to bring to notice, and was thus named. A more appropriate name would have been *Hedgehog*. It grows to the size of a quart bowl, and is so completely studded with long white spines that the plant is fairly eclipsed.

CEREUS ENGELMANNI

Is a very interesting variety growing along mountain sides among the rocks, either solitary or in clusters of two, three or more, rising to the height of ten to eighteen inches, two inches thick, ribbed, with long black and light spines three inches long. In May the flowers appear some three inches in length and as much in breadth when open, of a rich satin lustre and magenta purple, a most magnificent flower, followed in July by a purple fruit two inches in length, sweet and pleasant, resembling a strawberry in seed and sweetness.

MAMILLARIA PHELLOSPERMA,

or Fish-hook Cactus, is quite an interesting little plant, seldom growing larger than a medium apple, single and in clusters, on ridges and table mountains, is spherical and clothed with a coat of small, sharp spines curiously re-curved in such a manner that one may safely handle it without danger of wounding the hands. It has a small crop of light yellow bloom, quite minute, and in April, followed soon after by bright scarlet berries.

CEREUS CHLORANTHUS,

or Noon-blooming Cactus, is very nearly spherical, slightly ribbed, short, light colored skins, from four to six inches in diameter, growing singly and, sometimes, two or three from same root. Bloom about an inch across, lustrous yellow, always opening at twelve o'clock, clear or cloudy, varying very little in time.

OPUNTIA RUTILLA

Is oval shaped and flat. The plant is unostentatious and not striking in appearance, but in May is profusely covered with large buds that burst forth into gorgeous bloom—double rose-tinted, satin finish, large, rich and beautiful. Spines short and long, appearing on both sides and edges of the leaf.

OPUNTIA ECHINOCARPA,

Is a real tree Cactus, growing upon the desert or fertile plains, and putting out branches about two feet from the ground, which forms a firm, round, shapely head, often six feet in height, completely armed with spines, stout and sharp, and sorry be the man or animal that "runs afoul" of this terrible tree, which is often used as a hedge to enclose cultivated fields or pastures. The bloom appears in great profusion all along the branches, of a dull greenish yellow hue about an inch in length, followed by dry capsules of light-colored seeds. The spines give the plant a bright yellow appearance, and the wood fibre, when cleared of other vegetable matter, is curious indeed.

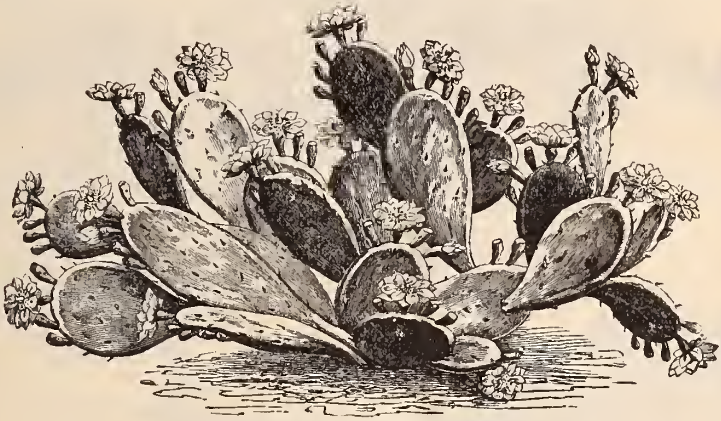


FIG. 167. *Opuntia Missouriensis.*

OPUNTIA MISSOURIENSIS,

Or some of its variable forms, is found throughout all our barren waste, forming immense spreading masses, and producing a profusion of yellow or yellow shaded rose flowers in May, and bright deep purple ovate fruit in the fall, which is quite edible.

YUCCA BREVIFOLIA

Grows into a tree, sometimes twenty feet high, and looks as though it might be, at least, a cousin to the Palm. The trunk or stem is a mass of fiber, finely and strangely woven; leaves also fibrous and short, armed with sharp points. It blooms at the top and end of limbs in June—a thick, heavy mass of light creamy flowers, from one to two inches in diameter. The spike is studded with lateral branches of flowers, the whole often weighing ten or twenty pounds. The seeds are thin, flat and nearly round, encased in dry capsules or pods. In approaching a grove of these by moonlight, one might easily fancy they were facing an army of giants. The whole of this tree is valuable as a paper material.

YUCCA BACCATA

Is the next most important, furnishing strong fibers in abundance for the manufacture of paper, cordage, ropes, rugs, brushes &c., and is the plant which furnishes for commerce the article known as Tampico. Leaves from two to three feet long by two inches in breadth, composed of vegetable and fibrous matter, armed with sharp points. The blossom stalk arises in June to the height of four to six feet, branching and heavily laden with large, plump buds that open out in large, rich, cream colored flowers, magnificent to behold, and yielding a strong lily-like perfume. Such a head of blossoms ought to command, in any large city, five dollars readily. The seed is round, flat and black, similar to last described. The fruit is edible.

YUCCA ANGUSTIFOLIA

Is a smaller plant in size, leaf and flowers, otherwise somewhat similar. The flower stalk is a little taller and more branching, color and fragrance much the same. The roots of both plants are valuable to the laundry, and are much used in place of soap; will make a lather equal, and for some uses preferable, to the best of soap. The leaves of both are used for strings to tie up grape vines and other plants.

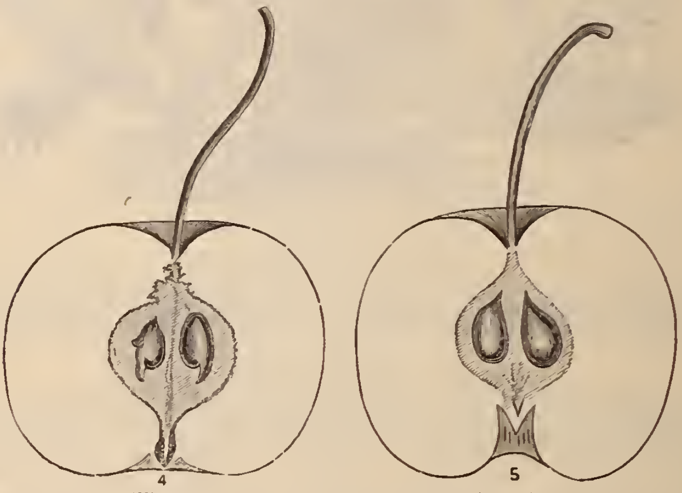
AGAVE UTAHENSIS

Seems allied to the Yucca family, grows close to the ground. Leaves six to eight inches long, sharp at the point, and spines like sharp teeth along edge of leaves, which are thick and strong. Flower stalk grows to a hight of twelve or more feet, with flowers, thickly studding the stem, of a pale color, lacking beauty, followed by dry capsules which contain the seeds. The bulb of the root is a great delicacy with the natives, who roast and prepare it for food which is sweet and delicious.

I have extended this article beyond all reason and bounds, and will stop without further apology, but in case there is a desire to hear more of the botany and flora of Utah, may resume my pen again.

[Yes sir, we shall be glad to hear from you always.—ED. BOTANICAL INDEX.]

NATIVE FRUITS.



(Fig. 4.) (Fig. 5.)

FIG. 168. *Pyrus Coronaria.*

PYRUS CORONARIA. LINN.

AMERICAN CRAB APPLE.

BY W. J. BEAL, AGRICULTURAL COLLEGE, LANSING, MICH.

THIS small tree extends from near lake Superior in British America to Louisiana. It is especially abundant in the highest of the Alleghany mountains. It thrives in open places, in cool soil which is deep and rich; though it is not uncommon in soil of moderate fertility. The tree varies in height from fifteen to thirty feet, according to soil and climate. The diameter of the trunk is three or four inches, but in some cases it reaches fifteen inches. The leaves are ovate or broad ovate, variously cut, serrate, and often lobed. The flowers are quite large, in corymbs, pale rose color, and very fragrant. The fruit is about one to one and a half inches in diameter, flat, globular, with a slight abrupt folded basin, and a very shallow cavity. The color is yellowish green, unctuous, and very acid.

The plate contains an illustration of a branch with leaves and two apples, with a section of a third, about two-thirds the natural size; also a flower and a flower bud. The latter is copied from Michaux's North American Sylva. There are thirty-five or forty species of *Pyrus*, natives of both hemispheres, in the north temperate zone. Along the Alleghanies there is a narrow leaved Crab Apple, which may be a distant species from the one here figured. In Oregon we find *P. rivularis*, which bears small, reddish yellow fruit, about the size of that borne by Mountain Ash; the Indians use it for food.

To a limited extent, the Crab Apple has been tried as a hedge plant. It is well adapted to a high northern latitude; is a very stiff grower, well covered with sharp spines; grows faster than hawthorne; is hardy and not liable to disease. At Michigan Agricultural College, there has been started a short hedge of this plant.

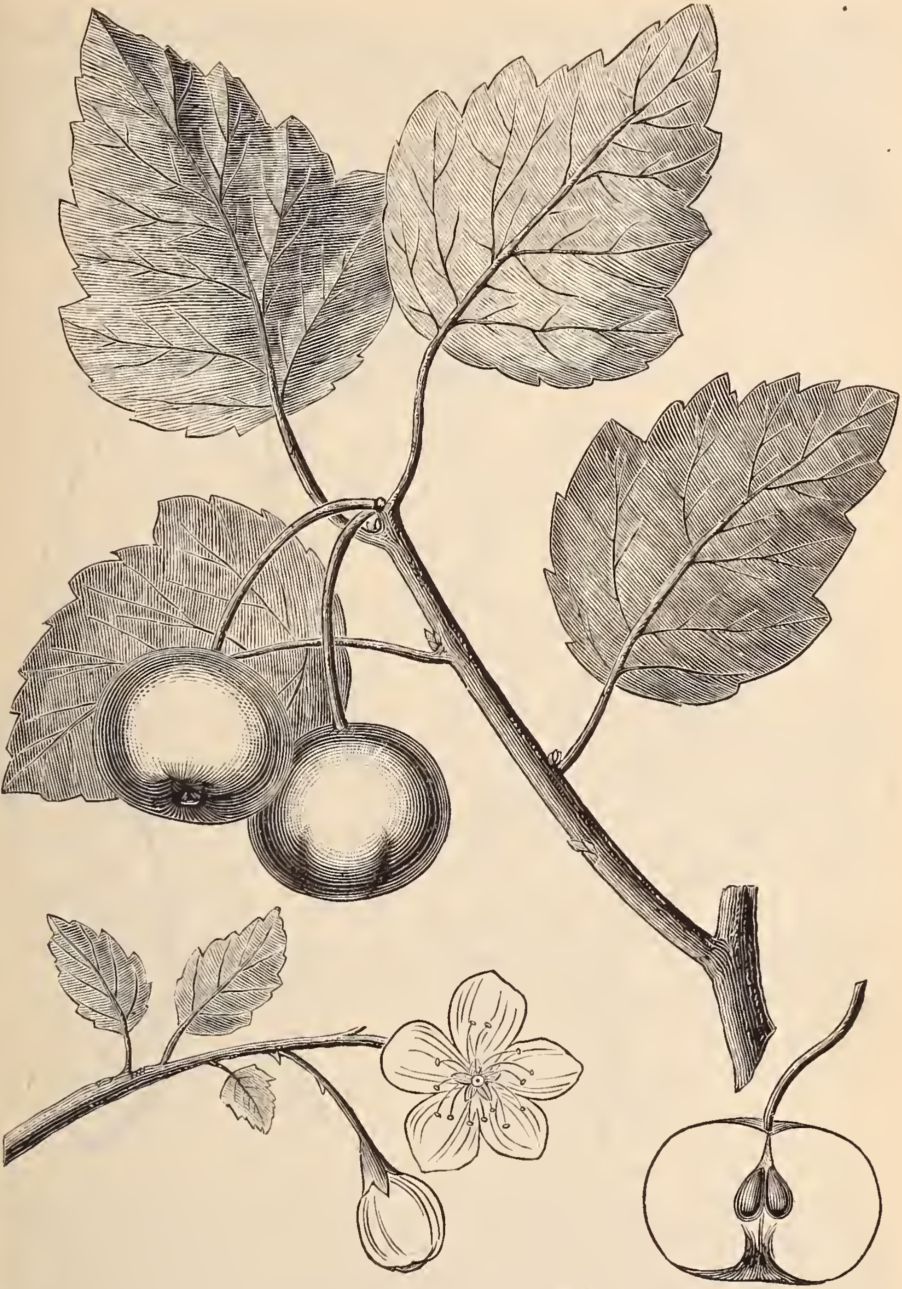


Fig. 169. *Pyrus Coronaria.—After Michaux.*

In the city of Lansing, near by, is a close row along the front line of a city lot. These trees have been allowed to grow in a natural way. When in flower, the display is very fine, filling the air with their delightful perfume. The thorns, rough bark, crooked limbs, and rather open top, gives the tree a rather picturesque appearance. Perhaps these may be some of the reasons why it is not much used in this country as an ornamental tree, though it has long been considered one of the prettiest flowering shrubs in England.

The American Crab Apple is probably capable of improvement by selection and cultivation. Why not? Every thing that has been faithfully tried has improved sooner or later, under the fostering care of man. What virtues lay hidden in this wild fruit, probably we may never know; as no people will be likely to persistently try to improve a sour, wild apple, while we already have those so much better.

Pyrus Malus and *P. prunifolia* already have the lead. Certainly, for over two thousand years, the common apple has been undergoing improvement; how much longer no one knows. In a late essay, Dr. A. Gray "speculates as to what our pomology would have been if civilization had had its birth place along the southern shores of our great lakes, the northern shores of the gulf of Mexico and the intervening Mississippi, instead of the Levant, Messopotamia, and the Nile;" our apples would have been developed from *Pyrus coronaria* and might have equalled anything we actually possess from *Pyrus Malus.*

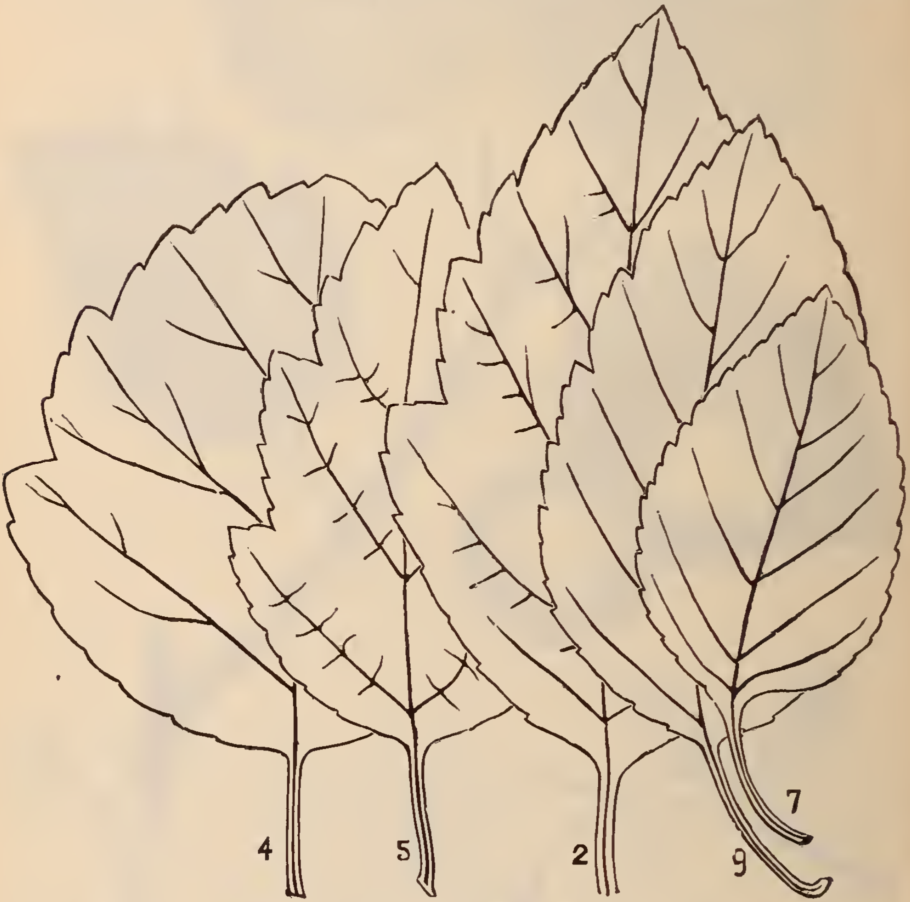


FIG. 170. *Various Forms of Leaves of Pyrus Coronaria.*

It is not certain that this species can be crossed in either way with our common apples. On two seasons several attempts were made by the writer, but all to no purpose. Like experiments made in crossing our cultivated Crab Apples on the wild species have been successful, and will be continued. In this way we can get new blood into our cultivated Crabs, and, perhaps, gain some desirable point in tree or fruit for the coldest parts of our country. It may, however, turn out like a cross of our common cattle with the American bison; no advantage to the buffalo, and a great detriment to our cattle. J. G. Soulard, in the Horticultural Report of Illinois, for 1868, speaks of some trees which were cultivated and bore fruit three or four times the size of the ordinary fruit. He fancied they were not quite so harsh. The tree originated in Missouri, and was thought to be the result of a cross with our common apple, some of which grew in the immediate vicinity. Some specimens of the fruit were seven inches around. It is valuable for cooking, preserving, and jellies. He adds: "It will keep for two years with common care in a cellar, and will stand repeated freezing and thawing in a darkish place." Perhaps he might add, that without damage, it could be shaken or beaten from the tree and taken loosely to market in a lumber wagon.

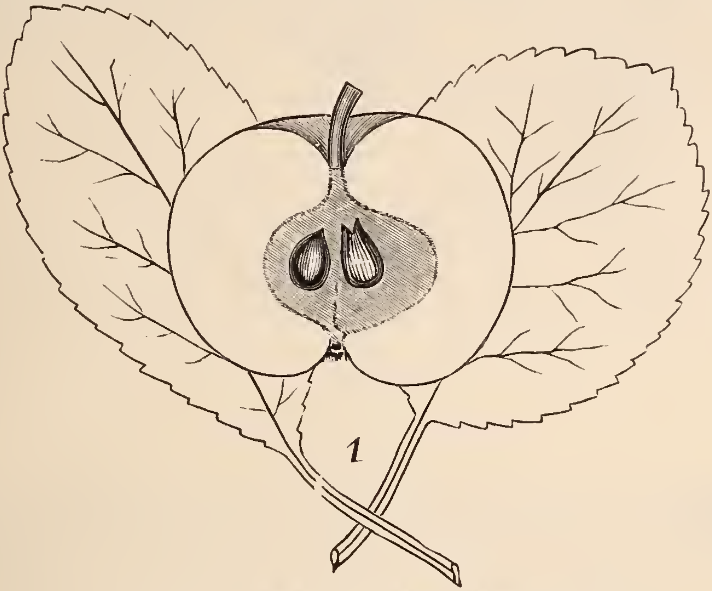


FIG. 171. *Seedling from Pyrus Malus.* (*Cultivated Apple.*)

Since writing the above about *Pyrus coronaria*, I have received a number of lots of specimens from various sources. Figures 1 1 1 are from Preble county, Ohio. The tree is very large, and produces a large crop of fruit every year. The leaves show no signs of lobes; not even coarse teeth. The apples all have short, stout stems. The eye is closed. The styles are slender, and unite at the base unlike any other mentioned below. I presume the tree is a seedling from our cultivated apple. In the eye of *Pyrus coronaria* the styles are stout and thick at the base, making a conical mass. The specimens were in alcohol and were not tasted to compare with other samples received.

[The fruit of this variety is of a deep green, and has the same intense sour and bitter taste as the fruit of *Pyrus coronaria.* The tree stands in the edge of a densly wooded forest, completely grown up with underbrush.—ED. BOTANICAL INDEX.]

Of another lot from near Richmond, Indiana, the editor of this magazine says: "It is evidently a seedling from *Pyrus Malus.* The fruit is small and knotty. Every specimen is deformed." One of the largest was two inches in diameter. The apples have the eye, the short stems, and the leaves like those sent from Preble county, O.

[The fruit has a pleasant, tartish taste, of a greenish yellow color with a rose colored or blush blotch on the sunny side. The tree stands in the edge of an old original forest, with very little underbrush.—ED. BOTANICAL INDEX.]

Figure 2 shows natural size and average leaf from Stark county, Indiana.

Figures 4 and 4 show natural size, a leaf, and section of fruit from near Richmond, Indiana. The fruit was unusually fair. Unlike any other specimens which I have seen, there were one or two brown streaks running from the base nearly around to the apex, much as is seen in the Tolman Sweeting.

In figures 5 and 5 we see natural size; one leaf; and a section of an apple. The latter is somewhat oblong. These were from Iowa City, Iowa.

Figure 7 shows a leaf from Henry county, Indiana. It is ovate and finely serrate.

Another lot of samples, from Indianapolis, contains leaves varying in shape from that shown in figure 4 to that shown in figure 7.

WHAT IS A "CRAB-APPLE?"

T. H. Hopkins writes to *Land and Home* as follows: Some writers seem to be somewhat "mixed" on this subject. This, perhaps, is due to forgetfulness of the fact that the word "crab," as commonly used, has no definite meaning. Botanically, a crab-apple is a wild apple. Of these there are several species, the best known of which are: (1.) The European crab, *Pyrus malus.* (2.) The Siberian crab, *Pyrus baccata.* (3.) The American crab, *Pyrus coronaria.* (4.) The narrow-leaved crab, *Pyrus augustifolia.* The last two named are both American crabs, No. 3. being the common wild apple of the Northern States and Canada, and the last belonging to the South. *P. coronaria* is, however, found south as well as north. *P. malus* is the wild form of our common apple. These are the crabs, *botanically* speaking; but pomology recognizes as a crab any small apple suited for cider making, such as Hughes' Virginia Crab, and others of a like character.

There has lately arisen a third use of the word, which may be called the nurseryman's, orchardist's and fruit-dealer's definition. The Siberian and American crabs having come into cultivation chiefly as ornamental trees, there has sprung from them (chiefly from the former) a class of apples differing from all others, and varying considerably among themselves. It is well understood that when wild fruits are subjected to cultivation they show a tendency to "sport," that is, to change their size, color, flavor, etc., frequently for the better. Sometimes this sporting occurs only on a single limb. It is then called "bud variation," and may be perpetuated by budding or grafting from that limb. But, usually, sporting occurs from the seed, and the product, if better than the original wild fruit, is called an improved sort, and if from a crab-apple, an "improved crab."—*The Pacific Rural Press.*

A NEW ESCULENT.

WE clip the following from *The Pacific Rural Press*, which is probably a *foundation for a new table vegetable.* An attempt is being made in France to popularize the use of Ferns as an article of diet. Most of the common Ferns, found in our woods and forests, contain more or less starch, and when properly prepared are extremely palatable. The stem, as it lies buried in the ground, is of very unpleasant taste and smell, and it would be impossible to use it in this state. So, too, are the young shoots of asparagus altogether unfit to eat before they have protruded through the soil of the beds on which they are grown. But, like them, the Fern, when exposed to the air and sunlight, becomes fleshy, white, tender, and of remarkable delicate flavor. One of the most famous landscape painters of France is said to pride himself more on his invention of an "*ome-lette aux pointes de fougere*," than on any of his highly successful artistic productions. His *specialite* is prepared from the commonest variety of all, the ordinary brake Fern. As yet the use of Ferns for food in France is very restricted, and the authors of the crusade in its favor are seeking tó gain converts to their doctrine by pointing to the example of other countries. In Japan, for instance, the inhabitants of the lofty clay hill-lands almost live on the Fern all the year round. In spring they eat the tender young leaves, called "Warabi," and later in the season, on the starch which they extract from the roots. This is prepared by washing the roots, bruising them with a mallet, and stirring the crushed pieces in vessels of water, at the bottom of which the starch is deposited. The vessels used are generally made from the hollowed trunks of trees. As much as 15 per cent. by weight is often obtained from the roots thus treated. Every hamlet in Japan has a special place set apart for this process, the heaps of residue around which indicate the great extent to which it is carried on. To ensure a rich growth of Ferns, the natives are accustomed to burn down the herbage and brushwood under the oak and chestnut trees every second or third year.

THE AMERICAN GRAPE CROP, 1879.

Among the many growing industries of the United States, of which only a passing notice is usually given is that of the Vinticulturist or grape growing. All our people in different portions of the country grow large quantities for their own use, of which no account is ever taken in making up the annual tables of the crop so that only a very indefinite estimate can be made. From the three largest grape producing sections of the country we learn the crop for 1879 to be: Missouri, with 1,500 acres in cultivation, producing 500,000 gallons of wine; Sandusky, Ohio, and vicinity (including the Lake Erie Islands) has 4,000 acres in cultivation, producing 16,000,000 pounds of fruit, and the reported quantity of wine produced is given as 1,526,400 gallons; California has 60,000 acres set with 45,000,000 vines and represents in money value (including the land) $30,000,000.

NEW & RARE PLANTS

B. CASE RICHMOND IND
FROM J.V. & S. LONDON
CASE

[We would request any one having new or strange Plants, to send us a notice for publication in these columns.]

SEEDLING ROSES AT LYONS.

BY JEAN SISLEY, MONTPLAISIR, LYONS.

THE Roses shown at the late exhibition here were not so numerous as usual and contrary to the general rule, the blooms, and particularly the Teas, Bengals, and Noisettes, were not so fine as they ought to be in our favorable climate at this season of the year; while in June and July the hybrid perpetuals were all that could be desired. Some new seedlings were exhibited, but of their merits I cannot conscientiously inform your readers because in my opinion cut flowers do not convey a fair idea of the value of a new variety, as much of course depends upon its growth, foliage, and its more or less free blooming properties, hardiness, &c., unless at first sight it shows something very distinct, either in shape, size, color, or scent. Nevertheless there was one with which I think proper to make your readers acquainted. Being struck by the large truss of blooms exhibited I made up my mind to learn more regarding the plant. I therefore went to the raiser, Madame Veuve Rambaux, where I found a great number of plants of it covered with blooms, and on nearly all the branches numerous clusters of flower buds. They had been continually in bloom the whole season; it is a seedling from *Rosa polyantha.* The plant, which is dwarf (being about one and one-half feet high), is vigorous, and what is very remarkable, some of the trusses rise about one foot above the foliage and consist of a considerable quantity of blooms both open and in the bud state; on one I counted sixty-five, a number, as far as I know, very uncommon. The flowers are pure white and last very long in perfection; they measure about one and one-half inch in diameter, are very double, and shaped like *Paquerette* (of Gillot fils), also a seedling from *Rosa Polyantha.* Each truss will make in itself a splendid bouquet. It will doubtless make a fine pot Rose, and as such will be useful for table decoration if forced to bloom in the early part of the year.—*The Garden.*

GERANIUMS OR PELARGONIUMS.

BY JOHN THORPE, QUEENS LONG ISLAND, N. Y.

FROM the growing and deserving popularity of these beautiful plants, I am induced to say a few words generally, and to call attention to some of the very newest varieties. The time is long past when four or, at most, eight varieties was deemed sufficient for all purposes, and lovers of beautiful colors anxiously await the advent of each new aspirant for a place among an already good collection. Few genera of plants have so wide a range of color as *Pelargonium*, but the species I now have reference to are our every-day Geraniums, which have been so metamorphosed as to be almost unrecognizable as "species." A few years ago it was very easy to distinguish seedlings of either *P. Zonale*, *P. Inquinans* or *P. Peltatum*, but to-day it is difficult to decide where the influence of one parent began and the other left off. The most popular class at this time is the semi-double class, comprising mostly descendants from *P. Asa Gray*, that fine achievement of Mons. J. Sisley, (long may he live,) and some in breeding with varieties of *Inquinans*, of which *P. Madame Lemoine* is the type.

In the following list will be found varieties surpassing all others in their several styles of color, or varieties quite new in color. The list was made up after mature deliberation and severe criticism of nearly two hundred varieties, about the middle of July, the worst period of the whole year for such a task, yet I am sure whoever obtains any or all of them will not be disappointed.

SEMI-DOUBLE VARIETIES.

Le Niagara—pure white, immense trusses.
Boule de Neige—another fine white.
Nymphe Neige—yet another fine white, slightly tinged with pink.
Gambetta—deep red, new shade; fine.
Rubis—a new shade of crimson scarlet.
M. Pasteur—deep claret crimson; rich.
M. Machet—orange, shaded very brightly with rosy salmon.
La Lorraine—a superb variety, deep shaded orange.
Mavourissa—very beautiful dark variety.
M'de Joubert—a new shade of pink; fine.
De Candolle—very deep pink, shaded carmine.
Amateur Olry—a new shade of purplish maroon.
Ed. About—orange, red and copper color; quite new.
Emile de Girardin—deep shade of rosy pink.
F. V. Raspail—very dark, very dwarf, very fine.
M. Thiers—a light shaded, flesh colored variety; distinct.

The three following are from our own seed bed, and are really fine varieties.

Henry Cannell—deep scarlet, large flowers.
Mrs. Charles Pease—a double Master Christine.
Wm. Cullen Bryant—probably the finest single scarlet flower ever raised.

A fine single pink is *Concours Regional*.

A fine bronze is *Prinee Bismarck*.

Now, Mr. Editor, if you can find room in the next number of your INDEX, I will, probably, send a few notes on growing Geraniums in pots for summer.

CATALPA SYRINGÆFOLIA.

THIS beautiful flowering tree forms at present a conspicuous object in pleasure grounds, being covered with flowers that are spotted like those of a Foxglove. Catalpas evidently like full exposure to sunshine and air, as I find that those on the sunny slopes of our hills are much more floriferous than trees in shaded positions. The young wood like that of the Paulownia, which the Catalpa somewhat resembles in habit and style of growth, is soft and liable to injury from severe frosts when in an unripened state, but when fully mature it withstands a considerable amount of frost, and in order to ensure that condition it should be planted on well drained soil, and not grown over luxuriantly. The Paulownia with its singular purple flower spikes was most effective here in spring, and now the Catalpa is even more interesting, owing to the dearth of flowering trees which there is late in summer.—*J. Groom, Linton, in The Garden.*

YELLOW FRUITED GUELDER ROSE.

HAVING for many years grown this fine hardy shrub in the south of Ireland without ever succeeding in geting it either to flower, or produce its ornamental bunches of bright colored berries, I availed myself of a visit to the unrivalled collection of my friend, M. A. Lavallee, at Segrez, on Monday last, in order to see this shrub, which was then in full and copious fruit in one of his shrubberies; and on his pointing it out to me I was much surprised to see the berries of a most brilliant scarlet color, instead of yellow as I expected them to be. M. Lavallee, however, informed me that the color they assume in the early autumn is bright golden yellow, which, as the season advances, changes to scarlet, and ends by becoming black as ink before the berries fall off the bush. The birds usually so fond of berries do not seem to touch these at all.—*W. E. G. in The Garden.*

AMONG the curiosities on exhibition at the meeting of the Indiana State Horticultural Society, held at Dublin, Wayne County, Indiana, December 16, 17 and 18, 1879, was a specimen of *Paulownia imperialis*, which had made the enormous growth of fifteen feet in height and five inches in diameter in one year. The original tree was planted several years ago by a resident of Dublin on his lawn, but the winters are too severe for it and each year it dies to the ground, but the root remains uninjured and in spring throws up from two to four shoots that make similar enormous growth.

CORRESPONDENCE

MINNEAPOLIS, MINN., October 17, 1879.

L. B. CASE.—*Dear Sir:* Have you Lake Minnetonka on your list of places in which the *Nelumbium Luteum* is found? If you have not, I have the pleasure of making this additional locality of that interesting Lily known to you. It is at the extreme head of the lake, on one side of a small, lovely bay, and the bed of Lilies extends about eighty feet in length and, perhaps, fifteen in width. The outer ones are in quite deep water, some of the stalks being nine or ten feet long. It has not been found in any other place about the lake, nor anywhere else in this state that I have heard of. The wild Calla grows in many places in this state.

The Trailing Arbutus is found in abundance near Duluth, but resists all attempts to cultivate it in this locality. Respectfully Yours, P. A. ATWATER.

PERU, INDIANA, September 17, 1879.

L. B. CASE.—*Dear Sir:* I have been expecting to meet you, but thus far have not been so fortunate. As I told you I would, I made a hurried trip to New Mexico. I saw the Pueblo Indians, and brought home specimens of their ware. When crossing the "Raton Mountains" I was surprised to find very beautiful flowers, and I arranged for seeds when they matured. I enclose three packages, which if you will propagate next spring, may interest you and me. I do not claim that they are "new," but in the situation on the mountains, 10,000 feet above tide, they seemed very beautiful indeed. They were gathered by an ignorant man, and are not marked, so that I cannot tell "which is which."

I found a "glorious climate," beautiful scenery, and a wonderful field for a careful and learned explorer. The country, although new, is old. The oldest house standing on this continent is in Santa Fe.

The old "Pecos" church is but a few miles from Las Vajos. There the sacred fire of the Montezumas went out. It was kept burning there upon the altar until all was lost; until Cortez and his troops had over run all those people, and then it expired, never again to be revived. "I tell you the tale as 'twas told to me," and I am foolish enough to believe it. It has poetical value, if not any other.

Let me hear from you at your leisure. Respectfully, D. C. D.

LONGFORD, TASMANIA, Oct. 23, 1879.

L. B. CASE, ESQ.—*Dear Sir:* In reply to yours of the 18th of August, I would say, Mr. Henry Parcell's name should not be forgotten in your list. Many parts of this little known island (strange to say) is virgin soil to the white man's foot. The gold and tin discoveries have done wonders in opening up our country, and also the efforts of the Van Dieman Land Company have been of great benefit, but the explorations of Mr. Parcell have been of more permanent value to the island than any thing else. I do not think there are any Water Lilies in Tasmania, but in Queensland they are unequaled for beauty, and for miles the swamps are covered with them. * * * * * Very Respectfully, JOSEPH ALLEN.

KNOXVILLE, TENN., Dec. 21, 1879.

MR. L. B. CASE.—*Sir:* Yours of the December 19th received yesterday, and I hasten to reply. Dr. Ferdinand Rugel was born at Wirtenburg, Ger., December 24, 1807. He came to this country in 1840, sent by Shuttleworth of Berne to make collections of plants and shells for him, which he did for many years in several of the Southern States and Cuba, where he found many new species. After a time (I do not know the year) he wandered into Jefferson county, East Tennessee, where he married, and where he died, January 31st, 1879. He made frequent journeys into the more Southern States, being absent for months making collections, the bulk of which was sent to Europe. It was part of the contract with Shuttleworth that he should not dispose of any specimens in this country. Trusting the above will be acceptable, I remain, Yours Respectfully, G. A.

J. VANDER SWAELMEN writes under date of Dec. 12, 1879, that he has received, this season, from his collector in Queensland a few seed (nuts) of a new dwarf ornamental tree not yet known in Europe, *Cerbera nerifolia.* The flowers are yellow and very fragrant. Mr. Vander Swaelmen is now attempting their culture, with fair promise of success.

ANNUAL REVIEW OF BOTANICAL PROGRESS.

[*Continued from Page 6.*]

WHEN we first resolved to publish an article on an "Annual Review of Botanical Progress," we set about the task of procuring information on the number of collectors so employed, and, although the time was then short, we have succeeded very well, and now having received additional information on the subject since the first pages were published, we will reprint the table from page 6 together with the additional reports.

		E. G. Henderson & Sons, London, England	B. S. Williams, London, England	Thomas S. Ware, London, England	M. Ortgies Zurich, Switzerland	E. H. Krelage & Son, Haarlem, Holland,	J. Vander Swaelmen, Ghent, Belgium	Louis de Smet, Gand, Belgium	August Van Geert, Ghent, Belgium
1.	Atlantic Islands						1		
2.	Australia					1	3	4	
3.	Brazil		S. L. C.			1	1	1	
4.	Central America	1	S. L. C.		1				
5.	Central Europe			1		4	3		
6.	China					1			
7.	India (all Southern Asia)		S. L. C.	1		1			
8.	Japan					1	1		
9.	Mexico			L. C.	2	2	1	2	
10.	New Guinea		3						
11.	New Zealand		3	1		1	1	1	1
12.	Northern Africa	2	S. L. C.	1					
13.	Northern Europe			8		2			
14.	Pacific Islands						5		
15.	Pacific coast of North America		2 L. C.	20		1	1	2	
16.	South America, except No. 3 and 20		S. L. C.	L. C.		5			1
17.	South Africa		2 L. C.	2		3	1	4	1
18.	Southern Europe					2			
19.	U. S. of North America			8		2	1		
20.	U. S. of South America		3	1					1
21.	Western Asia						1		
22.	West Indies		S. L. C.						1

This table is made up from the official reports of some of the largest commercial plant establishments of Europe for 1879, and conveys a good idea of the magnitude of the enterprise. Of course the tables are far from complete yet, but we hope next year to be more successful, especially, as we shall endeavor to commence in season, and also hope to convince our friends that we do not wish to *pry into their business for personal motives* by the information we ask, but simply wish to illustrate the fact, that the efforts of botanists will prove a blessing, from the benefits sure to follow a more extended knowledge of the world. It is not in the money value alone that these travelers and collectors bring to the firms employing them that the world is enriched, but each year they collect commercial and geographical facts of almost inestimable value to the whole civilized world. To illustrate this point more clearly, we will venture to publish an extract from a private letter from B. S. Williams, one of the famous new plant merchants of London, England. Mr. Williams writes: "My collector and his assistants have been in New Guinea for three years in search of Orchis, new plants, &c., and, while there, discovered gold for the first time, and made some explorations and discovered new islands and harbors on the south-east coast of New Guinea, which has been sanctioned and adopted by the Admiralty; these explorations were made in a schooner which I purchased for collecting on the coast." An extract from Mr. Joseph Allen's letter (page 27) will also serve to increase our admiration for these men. Perhaps we should also say that E. G. Henderson & Sons are among the largest and oldest new plant houses in London, but in their letter they only gave the number of skilled or professional botanists they employ as collectors and sent out to collect for themselves, while the number of local collectors was not given, which would have increased their actual numbers to at least twenty-five men.

RECENT PUBLICATIONS.

IN the October (1879) number of the INDEX we made the announcement, upon *second handed authority*, that Thomas Meehan's "*Native Flowers and Ferns of the United States*" had been temporarily suspended for want of patronage. We should have known officially that such was the case before making such an important statement, but thinking our *informant well informed* we did not mention the matter in our correspondence with Mr. Meehan. We now find we have made a serious mistake, which we take great pleasure in correcting. Mr. Meehan informs us that the undertaking is a perfect success and has more than paid expenses, and that it will be continued during 1880 by issuing a third series, of ninety-six chapters, in twelve numbers at fifty cents each, at intervals during the year of about a month each. The drawings are already made and the description will be prepared as fast as needed. This is certainly very encouraging, and we congratulate Mr. Meehan upon his success. Probably no botanical work of more importance was ever undertaken, certainly there is nothing like it in the world to-day, for in addition to the scientific descriptions, the carefully prepared drawings will destinguish each species almost as correctly as many authors descriptions. Again, these beautiful drawings will often create a desire for the readers to know more of the plants and, as a result, secure additional students and collectors. Mr. Meehan has entered upon the undertaking with a great deal of enthusiasm, and we all hope he may be favored with a long life to see the object of his desire accomplished. He says he could publish one hundred parts every six months just as well as only six as now issued.

Another very important work is "Bentham and Hooker's *Genera Plantarum*," which is of so much interest to many of our readers that we clip the following from the December number of the *Botanical Gazette:* "The first part of the third and concluding volume of this important work—to comprise the remaining Dicotyledonous orders—is now in press, and will be published in London at the close of the year. It is convenient and may not be improper to announce in the *Botanical Gazette*, that most of the botanists in the United States who possess this indispensable work thus far have procured it through the mediation of the subscriber, who, in view of the number of copies thus taken is supplied at a considerable discount, the whole advantage of which inures to the recipient. The two volumes already completed are published at £5, 6, 0. The price charged the subscriber is £4, 8, 0. The new part will be furnished at a similar discount. Botanists who have in this way obtained the published parts, and who wish to receive the remainder through the same channel, are requested to communicate their wishes in this respect, without delay, to The Curator of the Herbarium of Harvard University, Cambridge, Mass.—ASA GRAY."

At last we have a General Index to the annual Reports of the U. S. Department of Agriculture, and now they will be of some value as books of reference, but as it was, it was almost impossible to utilize them because it was so very difficult to find the article desired. There is a great deal of permanent value contained in these Reports, and now since they are becoming scarce they are more called for. The Index includes the whole series issued by the Department, from 1837 to 1876, and reflects great credit on Commissioner LeDuc, under whose authority it was published.

Between Horticultural Magazines, Journals and new books, no one need to lack for information in the world's progress in botany. But as their name is *legion* we can only refer to a few that present some feature of special interest. The *California Horticulturist* is devoted almost entirely to the interest of the Pacific coast, and fills its calling most completely. Indeed it is now one of the most important magazines of the day, and we hope it will still make the Horticulture and Agriculture of the Pacific coast a special study. The *Gardener's Monthly*, *American Agriculturist* and *Vick's Monthly* are indispensable to all practical cultivators, while the *Bulletin of the Torrey Botanical Club* and *Botanical Gazette* fill the eye of the scientist with delight at all times. The *American Naturalist* and *Silliman's Journal* often contain much of botanical interest, but they contain so many articles on other branches of natural history that we are often disappointed with certain numbers. But our constant supply of (literary) food in the shape of weekly papers is, after all, one of the greatest feasts we have, but where shall we commence to write of them for they come in immense numbers. Let us travel with the sun and gather a few as we go. In New York city we find the *Rural New Yorker* and *Moore's Rural Life;* in Albany, the *Country Gentleman;* at Indianapolis, the *Indiana Farmer;* at Chicago, the *Prairie Farmer* and *Factory and Farm;* at Lincoln, Neb., the *Nebraska Farmer;* at Lawrence, Kan., the *Spirit of Kansas;* at San Francisco, the *Pacific Rural Press* and the *California Farmer;* all of which are conducted in the most satisfactory manner, and all of which we take especial pleasure in recommending to our friends as worthy a place in each household.

From over the sea come to us so many choice and valuable publications, that we often wonder how they can succeed in such great numbers, but they all prosper, and nearly every year they present some new feature or new writer to add to their already desirable qualities. Those published in the British empire (at home or in the colonies) are rather familiar to the average American reader, but those from the continent are seldom seen, but are just as valuable to those who can read them. In the Horticultural Directory of this number (page 2) we give a list of seventeen of the most prominent, but as we can not individualize, we will speak only of the *Journal des Roses*, a quarterly (French) magazine, edited by M. Camille Bernardin, at twelve franc a year and postage. It is devoted exclusively to the Rose and Rose culture, both at home (France) and abroad, and is illustrated by colored plates from M. Scipion-Cochet, a famous French botanical artist. If this journal could also issue an English edition, we imagine it would be well received both in England and America, and be a source of much enjoyment to us all. It comes to us highly recommended by our old friend, Jean Sisley, which of itself is a sure guarantee of merit.

SOCIETY MEETINGS.

OHIO HORTICULTURAL SOCIETY.

REPORTED BY MRS. H. V. AUSTIN.

The thirteenth annual meeting of the Ohio State Horticultural Society was held at Canton, Ohio, on the 10th, 11th, and 12th, of December, 1879. The meeting was one of unusual interest, and long to be remembered. The managers of the Stark County Horticultural Society, at whose invitation the State Society met here, made ample arrangments for the meeting. A pleasant and commodious hall was secured, capable of seating the large audiences in the evening, and affording ample room for the tables upon which the exhibits were displayed. There was a good attendance of the citizens of Canton and vicinity at the meetings; the attendance of a large number of ladies indicated that the proceedings were of interest to them.

The forenoon of the first day was devoted to arranging the fruits, of which there was a handsome display, and informal preliminary business. The afternoon session was occupied with the report of the secretary, Mr. M. B. Bateham, reports from local societies, and reports from the ad-interim committee on the fruit crops and markets of the past year; also Secretary Bateham's report of the meeting of the American Pomological Society.

At the Wednesday evening session, Dr. John A. Warder, the president, opened the exercises by reading a selection of Scripture, which was followed with prayer by the minister of the Lutheran church. An address of welcome to the members of the State Society was given by J. K. Neisz, President of the Stark County Horticultural Society, and was responded to by President Warder. After this, came the President's Annual Address, given in Dr. Warder's happiest style, which was one of the most comprehensive, explicit and instructive productions ever presented to a meeting of this kind. A very interesting paper was read by the Secretary, contributed by Levi Stump, entitled :—"History and Progress of Pomology in Stark county."

The papers presented for discussion Thursday, were: How can old Orchards best be Renovated? The Codling Moth, Canker Worm and Curculio, how can their Ravages be Prevented? Science and Practice of Pruning, by G. H. Miller and others. Peach Culture, with Notes on New Varieties, by Secretary Bateham. Drying and Evaporating Fruits. New Varieties of Grapes, by G. W. Campbell, of Delaware. The Grape-rot Malady, by G. M. High and others. Raspberries and their Culture, by N. Ohmer and others.

Several interesting letters, addressed to the convention, were read; among them was one from Leo Weltz, of Wilmington, Ohio, who was detained from being present by business in southern Kansas. Delegates from other states were introduced and reported on the condition of their State Societies. Mrs. H. V. Austin, delegate from the Indiana Horticultural Society, and Mr. S. B. Mann, delegate from the Michigan Pomological Society, each made brief reports for the societies they represented.

The programme for Thursday evening was as follows: The first was an address by A. McGregor, Esq., of Canton, on the Importance of Cultivation; this was a fine literary production, containing many practical points, and was delivered in a truly oratorical style. Women as Horticulturists, was the title of an essay by Mrs. Helen V. Austin, delegate from Indiana, which it would not be in good taste for your correspondent to comment upon. The Influence of Horticulture on Rural Life, by Mrs. J. K. Neisz, of Canton, was an excellent essay. Following these essays, was an excellent paper by M. Milton on Window Gardening, Plants for Winter Flowering and their management.

The closing session this (Friday) morning was devoted to unfinished business, votes of thanks for hospitalities and courtesies received, etc. The following board of officers was re-elected for 1880: Dr. John A. Warder, President; M. B. Bateman, Secretary. After which, the meeting adjourned with the satisfaction of all having had a good time in general.

INDIANA HORTICULTURAL SOCIETY.

THE nineteenth annual meeting of the Indiana Horticultural Society was held at Dublin, Wayne county, Ind., December 16, 17 and 18, 1879, in the large commodious Town Hall which was filled with a large number of the most prominent Horticulturists of the State, as well as the adjoining States of Ohio, Illinois and Michigan. In addition to the practical Horticulturists present were a large number of citizens from all parts of the State, and especially from point near by. The display of fruit was fine, particularly in apples and pears, raised in Indiana. Grains and vegetables were well represented. Perhaps as interesting a sight was specimens of Catalpa wood from New Madrid, Missouri, that had lain under water a long time and was still in a perfect state of preservation. The seed and seed-pods of five varieties of Catalpas were also exhibited to illustrate the peculiar character of each species.

The first day was mainly devoted to the President's annual address, the Secretary's and Treasurer's report, the reports of the delegates to the different State associations, as also Sylvester Johnson's report as representative to the American Pomological Society. In the evening Dr. S. S. Boyd delivered the address of welcome in behalf of the citizens of Dublin, and Dr. Furnas read an able paper on the "Care of Orchards and the Profits of Fruit Growing."

Wednesday morning found the hall again well filled with delegates and visitors all anxious to learn from the experience of others. The first thing done to-day was the election of officers for 1880. Sylvester Johnson was re-elected President; W. H. Ragan, of Clayton, Secretary; Daniel Cox, Treasurer. The day was devoted to reading and discussing papers on the Chickasaw Plum, by Dr. J. H. Robinson; on Strawberry Culture, by Granville Cowing; on the Huddleston Strawberry, by David Huddleston; an essay on the Apple, by Mrs. H. V. Austin; a talk on Trees, by Mrs. Louisa V. Boyd. Also, reports from delegates from adjoining States and Perdue University. The day's exercises were closed by a Reminiscence or History of the Society, by E. Y. Teas, followed by a general Love-feast participated in by all the older members. Wednesday evening was set apart for a Lecture by Prof. C. V. Riley, on Entomology, but as he could not be there Prof. Brayton entertained a large audience with a talk on Birds, especially those known to be the horticulturists' friends, and illustrated his lecture by a large collection of preserved bird skins. Dr. Warder very reluctantly spoke for an hour on Entomology, which was both entertaining and instructive.

The third and last day found the interest in Horticulture as great as on the two former ones. The day's session opened by the presentation of the invitation from different societies and cities to meet at their respective places, and being fully discussed the invitation from the Horticultural Society of Crawfordsville was accepted as a place for meeting in 1880. Delegates to other State meetings were elected, premiums were awarded, the usual vote of thanks passed, and the annual meeting for 1879 adjourned *sine die.*

A CURIOUS SIGHT.

IN Mr. E. N. Atherton's report on the Sabaragamuwa (Ceylon) district, he writes: One of the most curious sights in the district is the manner in which iron at a white heat is handled by the blacksmiths, which is kept a secret in the trade, and only practiced by that caste. The process is simple but so repelling that I doubt whether any one would feel inclined to attempt it, as it certainly requires nerve to take up a ball of almost liquid iron the size of a twenty-four pound shot, and hold it in the palms of one's hand from twenty to twenty-five seconds, and afterwards deliberately stand on it for the same time. They make a paste of equal quantities of the Muranga root, leaves of the Bewila and Kapukannasa plant, and the tender shoot of the Gurulla finely ground with lime juice; and this spread over the palms and soles, makes them fireproof; for although you hear the hissing of the iron while being carried in the hands, it leaves no mark or injury when the paste is washed off.—*Weekly Examiner, Launceston, Tasmania.*

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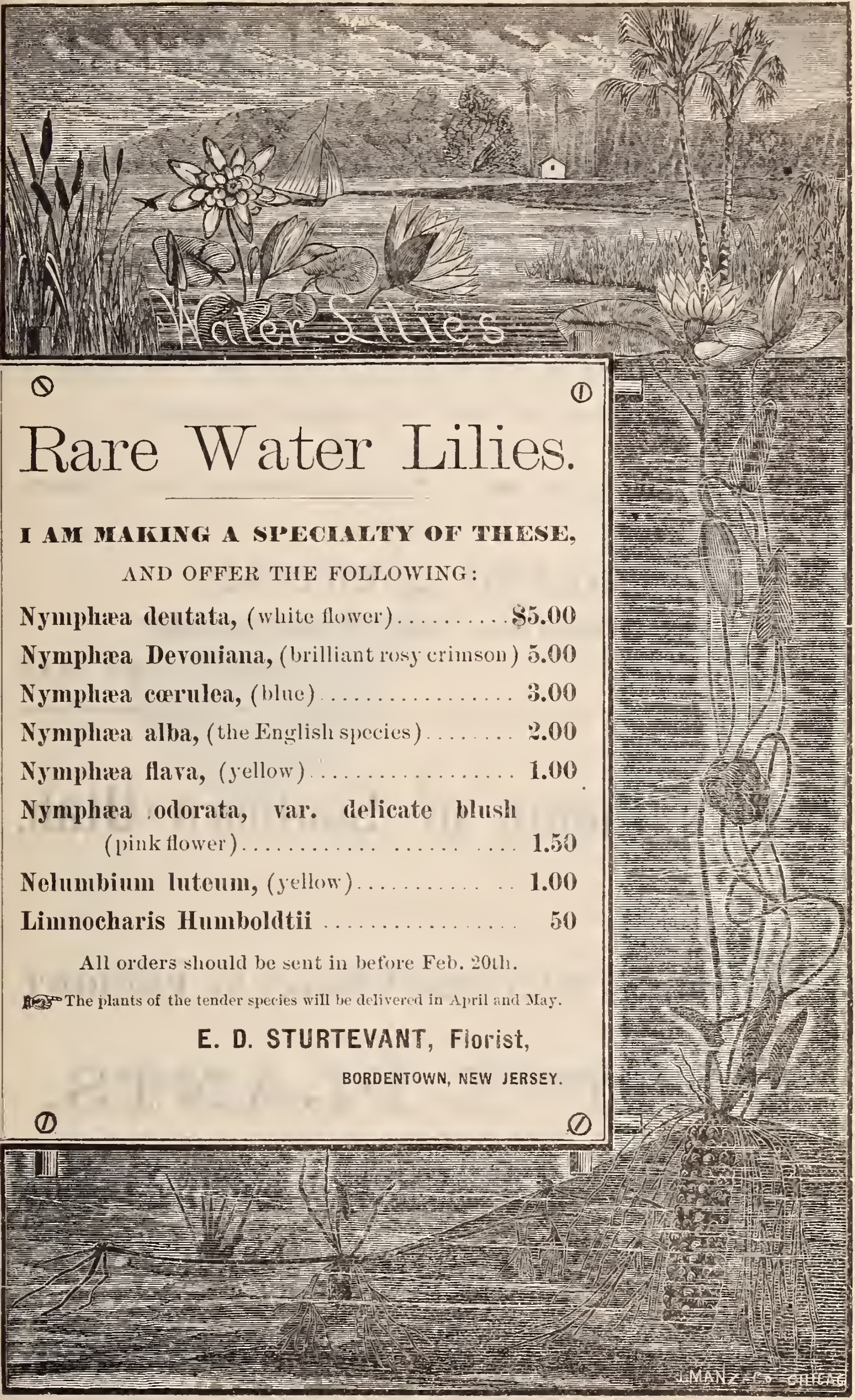

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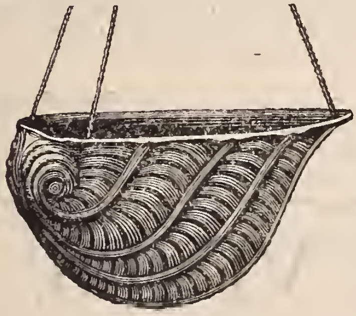

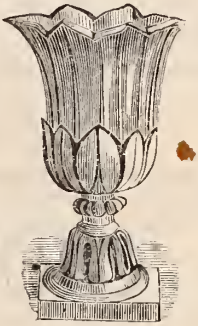

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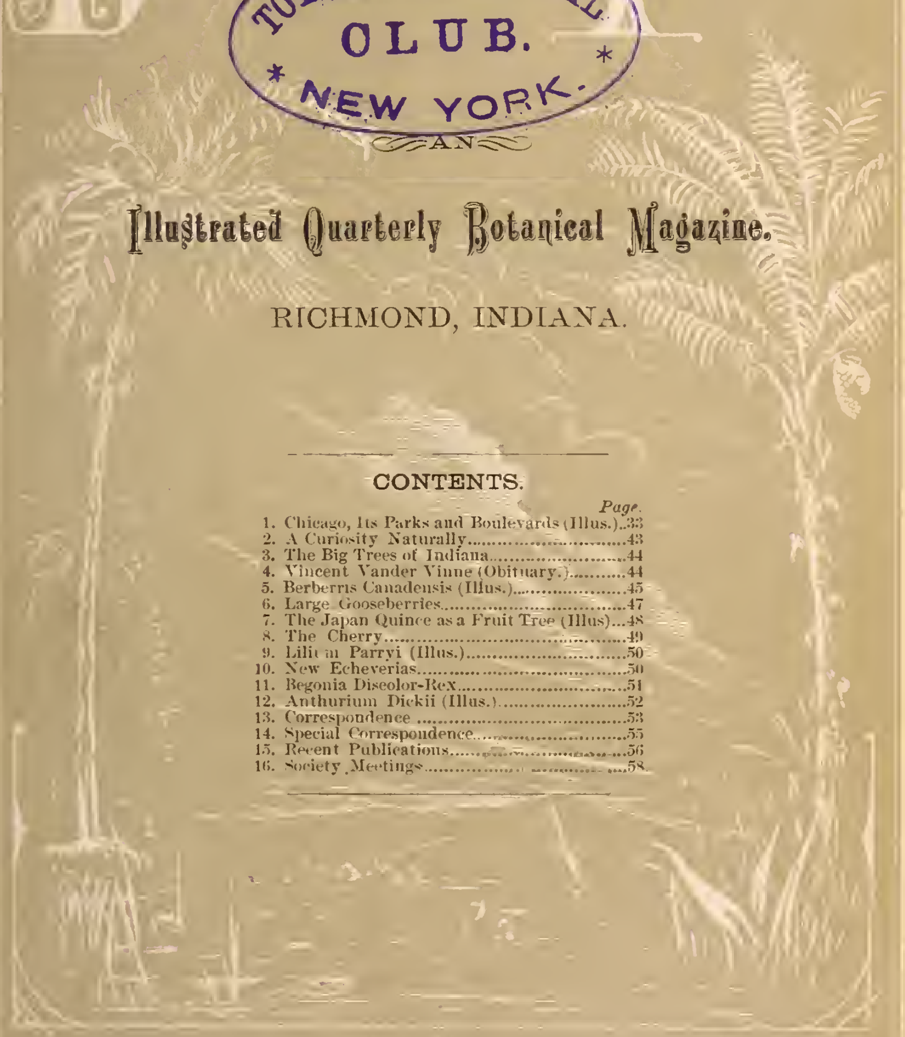

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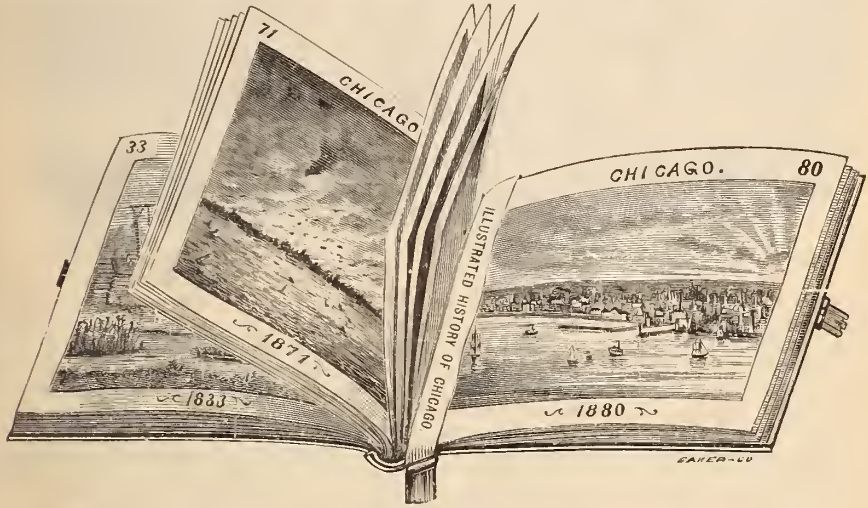


CHICAGO—ITS PARKS AND BOULEVARDS.

By common consent of all nations America is designated as the New World. In the progress of civilization this is certainly correct, for, however much geologist and ethnologist may differ in their conclusions, it is a truism that civilization as developed in the world to-day, dates back less than three hundred years in America. But civilization and commercial prosperity always go hand in hand together, and their presence develops still another prominent factor in the world's list of necessities, i. e., the great commercial emporiums or trade centres of the world. In studying commercial history we find these trade centres are well defined natural distributing points through which the bulk of merchandise, provision, etc., must pass or exchange ownership, and all efforts to direct trade through unnatural channels have always proved futile. Within the limits of the United States we have several of these more or less prominent commercial emporiums, some of which are so favorably situated as to be of great importance in the world's history; but the majority will prove of only limited influence and probably never reach the dignity of a great city. Of those whose location seems most favorable is the great city of Chicago. Being situated in the midst of a vast, fertile and productive agricultural district, with railroads converging from all points of the compass, and a cheap water communication open to navigation about eight months of the year, it certainly promises to become at no very distant day the great commercial emporium of all central North America.

But Chicago is a new city; at least, it has not been fifty years since the developments of the great West have changed this little frontier trading-post into a metropolis of half a million inhabitants. Perhaps it may be of interest to our readers to note its growth for the past few decades, and although it may seem out of place in a botanical journal to wander so far from our supposed subject, it is, nevertheless, interesting in this connection to know what can be done in a rich agricultural country in a short space of time, hence we will attempt a brief history of the town. First, the origin of the Indian name or word Chicago. It is a well known fact that in many languages a single word or expression is often used to designate many distinct objects or ideas, and in translating it is often quite difficult to positively designate the meaning of each word (sound). For this reason much controversy already exists among the most learned scholars of the American (ancient American Indian) languages regarding the meaning of many words, Chicago included. We think the most probable and reasonable translation is the one given by those who accept the words of the old Indian treaty ceding the Illinois country with certain boundaries to the French in 1773, which plainly says, Chicagou or Garlick creek. Now any one at all familiar with the dryer portion of the country around Chicago knows how abundant the wild onion or garlic, *Allium cernuum* and *A. Canadense* are found in the vicinity, and especially near the lake shore. Perhaps we might also add that they formed almost the entire source of food for Marquette and his party in their journey from Green Bay to Chicago in the fall of 1674.

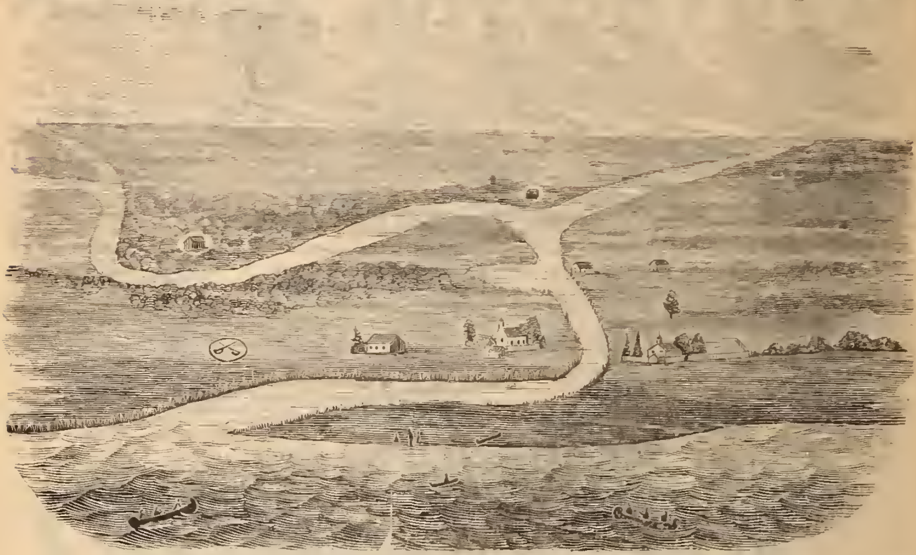


FIG. 173. *View of Chicago in 1818.* [*The first residence of Marquette is represented at the south bend of the river, and the Permanent Mission, his second location, (Wolf Point,) is represented at the junction of North and South branches.*

FIG. 174. *Missionary mode of traveling in America during* 1600.

The first white persons of whom we have a record of visiting the site of the present city of Chicago was Louis Joliet and Jaques Marquette, two French missionaries, who, upon their return from that most remarkable of exploring expeditions to the West in 1673, after coming up the Illinois and Des Plaines rivers to a point near the Chicago river, crossed over to, and sailed down the Chicago river to its mouth, where they launched their frail bark canoes on Lake Michigan for the Missionary Station of St. Simeon at the head of Green Bay, keeping near the shore all the way. Joilet continued on his journey to Quebec, but Marquette, who had already lost his health from exposure, remained at Green Bay through the winter and until late the next autumn (Oct. 25, 1674), when his strength being partly restored he again started for the Illinois Missions with two French companions and nine canoe loads of Indians. After innumerable hardships and sufferings they reached the mouth of the Chicago river late in December. Here they entered and ascended about two leagues (six miles), when Marquette's old disease (consumption) returning, accompanied by a violent hemorrhage of the lungs, he requested to be landed to die. They built a small log hut by the river for protection from the inclemency of the weather, which, however, they were obliged to abandon in early spring, from a sudden inundation from the river, and located their residence on higher ground, which became the nucleus of a permanent settlement or Mission. Marquette again set out on his journey to the Illinois country in March, 1675, where he passed the summer, and in the fall started on his return to the North, but died before reaching his destination, Michillimackinack. But this point (Chicago) had already been insensibly selected as a permanent settlement after the manner of most of the French frontier settlements of the period, by a population consisting of roving bands of Indians, deserters from the French government service, (army, explorers, &c.,) or from the chartered Trading Company, or often simply adventurers and small Indian traders, and who have ever since been known on the frontier as French voyageurs. They had no permanent homes, and from such a convenient point could change their fealty to the English at New York, &c., or to the French in Canada or southwest (Louisiana) as occasion demanded.

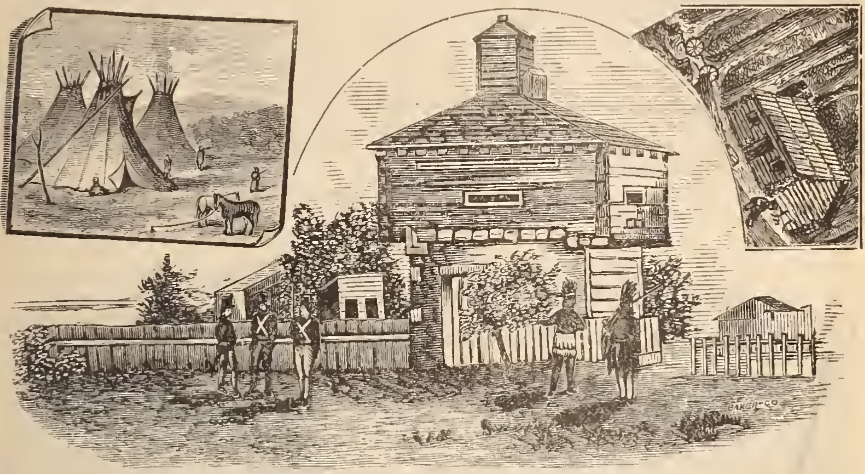
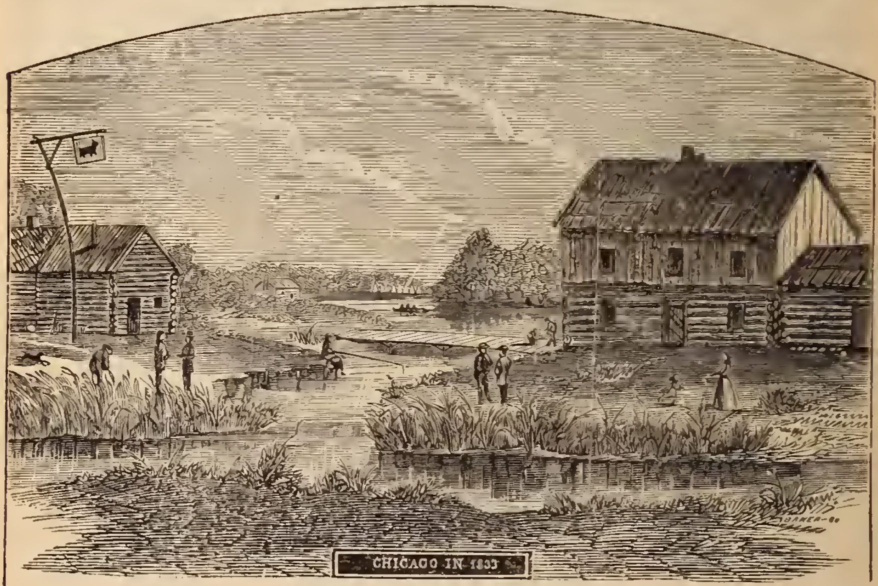


FIG. 175. *Fort Dearborn*, 1812.

Pursuing our investigations further we find that on the 18th of September, 1679, LaSalle, after exploring eastern America for a long time, left Michillimackinack on his first great Illinois voyage of discovery, stopping first at Green Bay, coasting along the western shore of Lake Michigan in his frail birch-bark canoes southward past Chicago river, around the head of the lake, and north upon the eastern shore until he reached the mouth of the St. Joseph river, Michigan, which he reached November 1st, 1679. Here he built a fort which he called Fort Miami, which was his future, western headquarters for the next few years, and from here he would sail up the St. Joseph river to the present village of South Bend, Indiana, and by carrying (portage) his light canoes across the prairies to the Kankakee river, a distance of only two miles, he could visit the Illinois river country, of which he held a charter from the French government. But this was a long and tedious journey, and on the 21st of December, 1681, he crossed the lake with all of his supplies, tools, and most of his colony, being fifty-four men, women and children, and made Chicago his future base of operations. From here he followed Marquette's old route to the Illinois country.

All the French frontier establishments at this period were built after one model, and consisted of a chapel, one or more houses (usually log huts), a storehouse and workshop, the whole enclosed with palisades (upright posts set close together), and forming, in fact, a fort. The Indian wigwams were never within the enclosure, but usually a short distance from it. In an old map of New France by Franquelin, 1684, illustrating the French settlements for 1679, 1680 and 1681, he marks "eighty h." (houses), as the size of Cheagouneman. This is probably the fort alluded to in the treaty between the United States and the chiefs of several tribes of Indians at Greenville, Ohio, 1795, in which the Indians ceded to the United States "one piece of land six miles square at the mouth of the Chekajo river, emptying into the south-west end of Lake Michigan, where a fort formerly stood." According to Franquelin's map the settlement is directly west of the junction of the north and south branches, and is the same as what in later times (1818) was known to the settlers as Wolf's Point. In Francis Parkman's *Discoveries of the Great West*, he has described some old unpublished maps of America, and in describing Galinee's map, 1672, he says: "On Lake Michigan, immediately opposite the site of Chicago, are written the words of which the following is the literal translation: 'The largest vessels can come to this place from the outlet of Lake Erie, where it discharges into Lake Frontenac (Ontario); and from this marsh into which they can enter, there is only a distance of a thousand paces to the River La Divine (Des Plaines), which can lead them to the River Colbert (Mississippi), and thence to the Gulf of Mexico.'" This with many other notes, found in old maps and MSS., definitely locate Chicago as one of the old French frontier posts.

The treaty of Greenville, (Ohio,) 1795, brought the war between the colonists (Americans) and French and Indians to a close, and the frontier trading-posts again assumed their former prosperity. Chicago, sharing in the general prosperity, attracted, among other adventurers, Jean Baptiste to its shores in 1796, who, after a brief and prosperous career as Indian trader, left, and was succeeded in his cabin and business by LaMai, another French voyageur who, in turn, sold to John Kinzie, as agent for the American Fur Company (of New York City). In 1804, the importance of the position was recognized by the General Government, and old Fort Dearborn was constructed near the corner of what is now Michigan avenue and Lake street, and garisoned with fifty men and three cannon. At the commencement of the second war with England, the Indians attacked and murdered many of the settlers around the fort (April, 1812), but most of the settlers escaped to the fort, where, with the small garrison, they were held in a sort of siege until the following August, when Capt. Heald, the commander, surrendered the fort and all the government property upon condition of a safe conduct to Ft. Wayne (Indiana). On the morning of the 15th of August, Capt. Heald and wife, Lieut. Helm and wife, with the little garrison of seventy-five men, including a few militiamen, and Capt. Wells with fifteen friendly Miami Indians, together with the few settlers still at Fort Dearborn, except Mrs. John Kinzie and family, started out on their fatal march to Fort Wayne. Mrs. Kinzie, with her four children, two Indians and two servants, took a


CHICAGO IN 1833

boat intending to cross the lake to their former home, Saint Joseph, Michigan. Mrs. Kinzie and party returned, however, after proceeding a short distance and were taken captives, but afterward were ransomed and sent to Detroit.

After reaching a point near what is now the corner of Twelfth street and Michigan avenue (represented by the crossed sword in figure 173) the Americans were attacked by a force of about five hundred Indians who killed twenty-six soldiers and twelve militiamen, at the same time murdering two women and twelve children in the baggage wagon. Seeing further resistance useless Capt. Heald surrendered and was taken back to the fort which was now burned. The entire party were afterward ransomed, including John Kinzie, who acted as surgeon during the fight, Mrs. Heald, Mrs. Helm and the surviving officers and soldiers of the garrison. The fort was rebuilt in 1816, near Rush street bridge, and the last of it was burned during the great fire of 1871. In 1820, the settlement consisted of eight white (including French) families, including Col. Beaudien who had bought the rebuilt American Fur Company's Warehouse, and converted it into his residence called the Wigwam.

In 1830, Chicago contained only one hundred inhabitants, composed of whites, blacks, Indians and half breeds; but during the following decade much progress was made in the settlement. The settlement contained nothing but log huts and Indian wigwams. In 1832, the first frame house was built by John Kinzie on the north side of the river. In 1833, the first brick house was built. In 1834, the first vessel entered the harbor. In 1837, Chicago was incorporated as a city with 4,170 inhabitants. In 1840, the population was 4,470. In 1850, it was 29,964; in 1860, 112,172; in 1870, 298,977; in 1874, 395,408; in 1876, 407,661. As there is no definite means of knowing the exact population on the first of January, 1880, we must give the approximate numbers, obtained in the usual manner, viz: by the enumeration as given by the school board and city directory, which, by competent authorities, is estimated at over 500,000. The Great Fire of October, 1871, is also one of the memorial as well as historical events of Chicago, of which we can only briefly notice. That portion of the city destroyed by fire of 1871 is represented on the map by the great dark space (1–3).

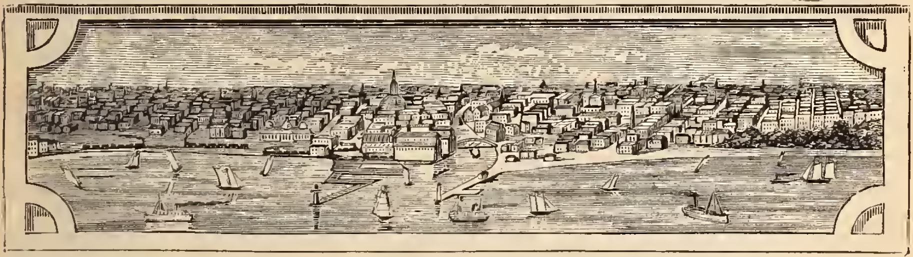


FIG. 177. *Chicago in* 1880.

So much for the past history of Chicago, but as we wish to deal with Chicago of to-day we will take up our quarters at the finest and best hotel in the country, the Palmer House, and from here visit the places of special interest to the botanist or plant lover. Before we leave the hotel, however, let us know something of our temporary home. First, we will say that the building is literally fire-proof; that not only are the walls built of iron, stone, brick, marble and mortar, but every joist, floor and partition is also of the same indestructible material; that there is nothing combustible about the house, except the furniture, and if, by any chance, the furniture or clothing in the room adjoining ours was to take fire we need not tremble for our own safety, for after burning the contents out of the room where it originated, if the doors are kept shut, the fire must cease for want of fuel. This is a great consideration with a tired and weary traveler, for who has ever visited a large city and closed the door of his room in the hotel at night without contemplating the chances of escape in case of fire? It is the last thought as we close our eyes in sleep as well as the first one to present itself if we chance to hear an unusual sound or even a hurried footstep through the hall during the night. It is built after the modern ornamental style of architecture, very beautiful and elaborate in design and finish, with large and spacious rooms, halls and parlors. The dining-hall is a marvel of beauty. It is sixty-four by seventy-six feet square, and contains some of the finest fresco painting in the West. But what adds much interest to the place is the fact that immediately over the dining-room, and of the same size (sixty-four by seventy-six), is a beautiful glass structure for a conservatory, in which are grown the many choice plants used every day in decorating the house and table. The illustration, (figure 176) really fails to do the conservatory full justice; in fact, it would be difficult to correctly portray its beauties. It is filled with choice palms, tree ferns, tropical fruit, rare foliage and flowering plants in great luxuriance. It is on a level and communicates with the corridors of the fifth floor, so it is always easy of access and certainly makes a pleasant resort to while away an hour when time hangs heavily on the traveler. Like all the other portions of the building, it is built entirely of glass and iron, and is heated from the same steam-pipes that warm the whole structure. The roof is of the same height as the main portions of the building, consequently the room is two stories high.

Having satisfied our curiosity with the beauties of our new home, we will now visit some of the places of special interest in the town, after having devoted a half hour to a table loaded with the bounties of the land. A short drive takes us to the

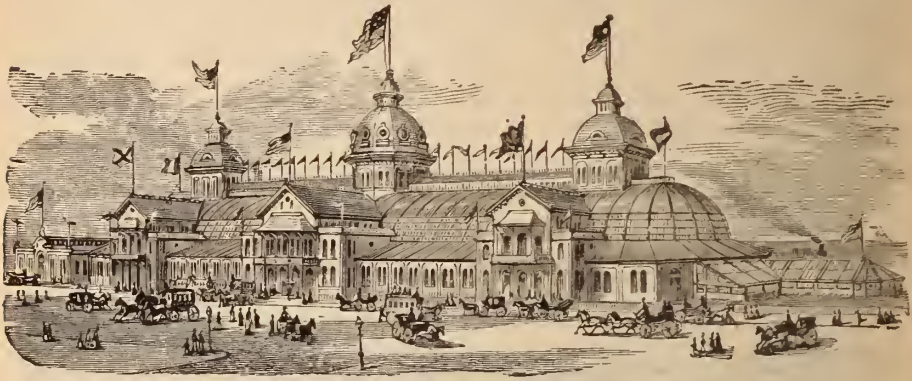


FIG. 178. *Industrial Exposition Building.*

Exposition building (fig. 178), which is now (September) in full blast with its exhibits of specimens of the wonderful crops contributed by all the States of the great North West; choice samples of dry goods and groceries from the large commercial establishments, and a rich display of machinery, manufactured articles, paintings, and everything of interest is here *right royally* represented. But as a special portion of the building is devoted to plants or floriculture, we will visit Floral Hall, which is a small portion of the southern end of the main building, to which has been added an *annex* to accommodate the numerous applicants for space, and which is well filled with choice and beautiful forms of plant-life in splendid foliage or flower. The building occupies the southern portion of the ground originally held by the Government as Fort Dearborn Military reservation, and lately considered as a portion of Lake Park. It is eight hundred feet long and two hundred feet wide, exclusive of the additions which have been built each year to accomodate those wishing to exhibit machinery, plants, &c. But a hasty look at the Exposition will satisfy our curiosity, and we will soon visit the adjoining Park immediately south on the shore of Lake Michigan. The city appropriates each year a certain sum of money to improve and beautify the so-called Lake Park, but as the city virtually has no legal title to the ground, the Park Commissioners do not feel at liberty to expend a very large sum on it. To thoroughly understand the situation it will be necessary to give a brief history of the Park. In 1821–2, Congress chartered the Illinois and Michigan Canal Company, ceding them certain lands. In 1827, Congress granted the Company still further privilege and lands, and the Illinois Legislature soon after perfected the organization by appointing Canal Commissioners to locate and build the canal. The commissioners commenced this work immediately, and in the Autumn of 1829 authorized the laying out of the "Town of Chicago" on the alternate sections of land, at the mouth of Chicago river, ceded by Congress to the Company. This was the first legal existence of Chicago. The land lying east of Michigan Avenue and between Madison Street and Park Row was laid out by the commission in lots and blocks, in April, 1836, but never sold. This was platted as fractional section 15, addition to Chicago. The northern portion of Lake Park, from Madison Street to Randolph and from Michigan Avenue to the lake, was originally a portion of the Fort Dearborn Military reservation, and was conveyed to the city by Mr. Burchard, Agent for the Secretary of War, in June, 1839. All this strip of land from Randolph Street to Park Row, a distance of nearly one and a half miles in length, contained very little dry land previous to 1870, but as the break water and railroad track, built by the Illinois Central Railroad from Park Row to the north of Chicago river, enclosed a shallow portion or arm of the lake which afforded a convenient dumping place for refuse matter in cleaning up the debris of the great fire in 1871, a strip of

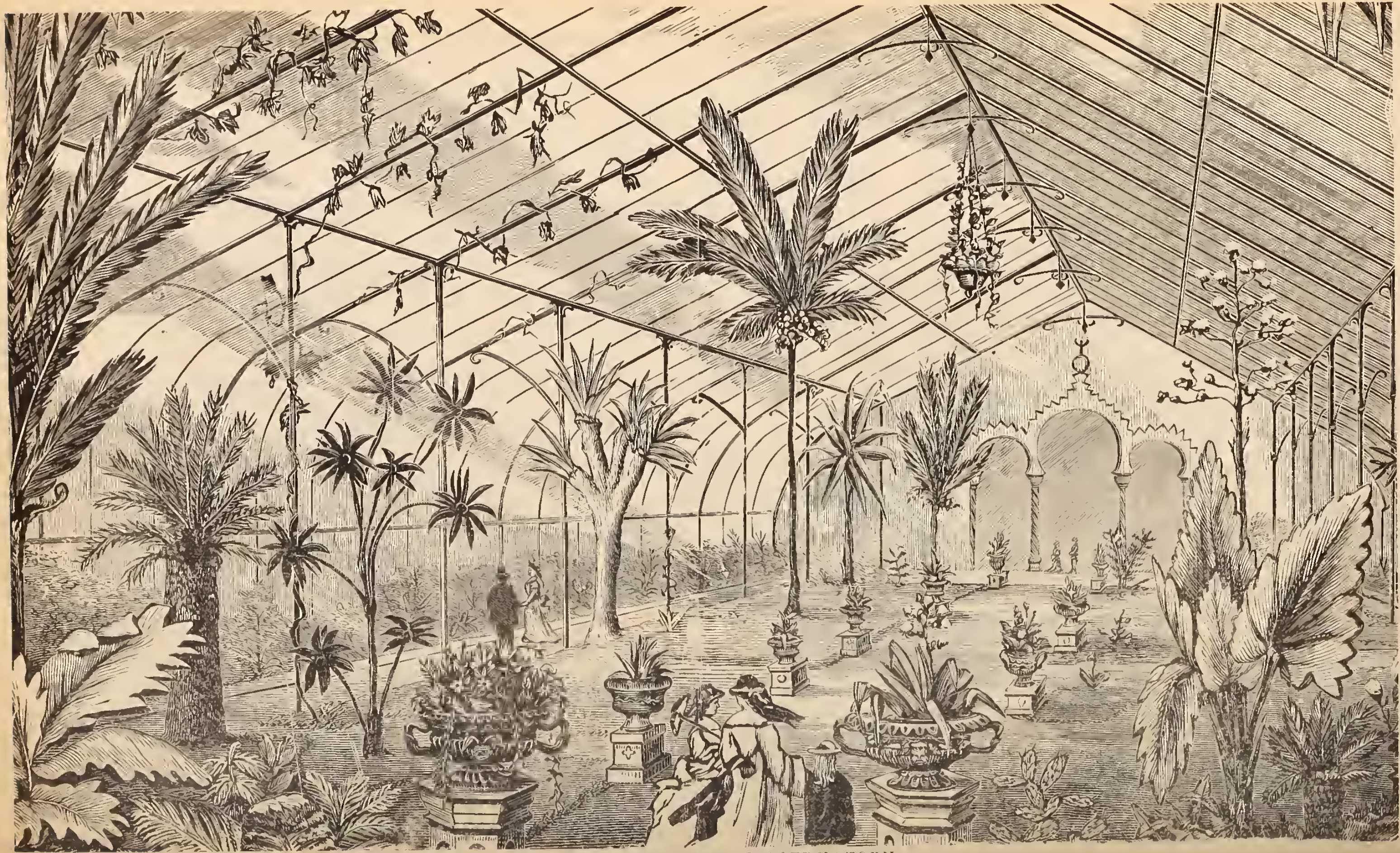
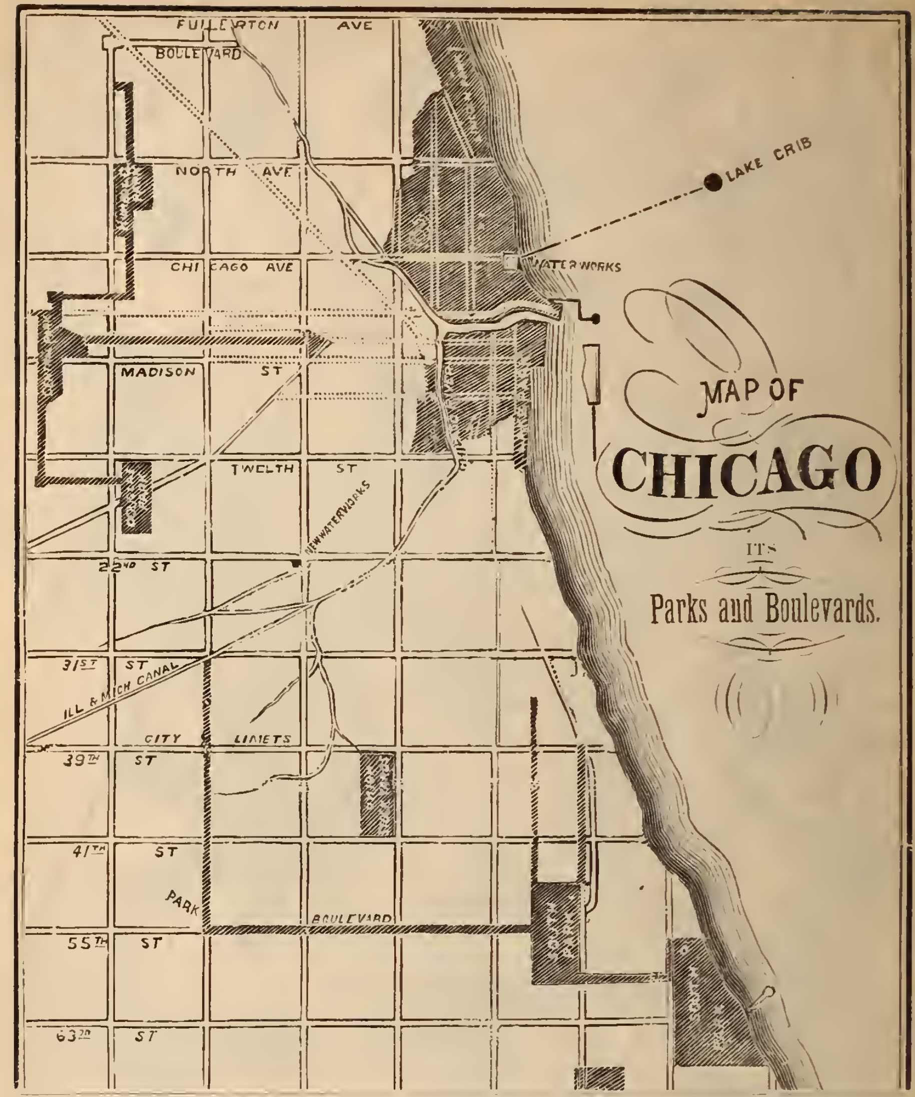
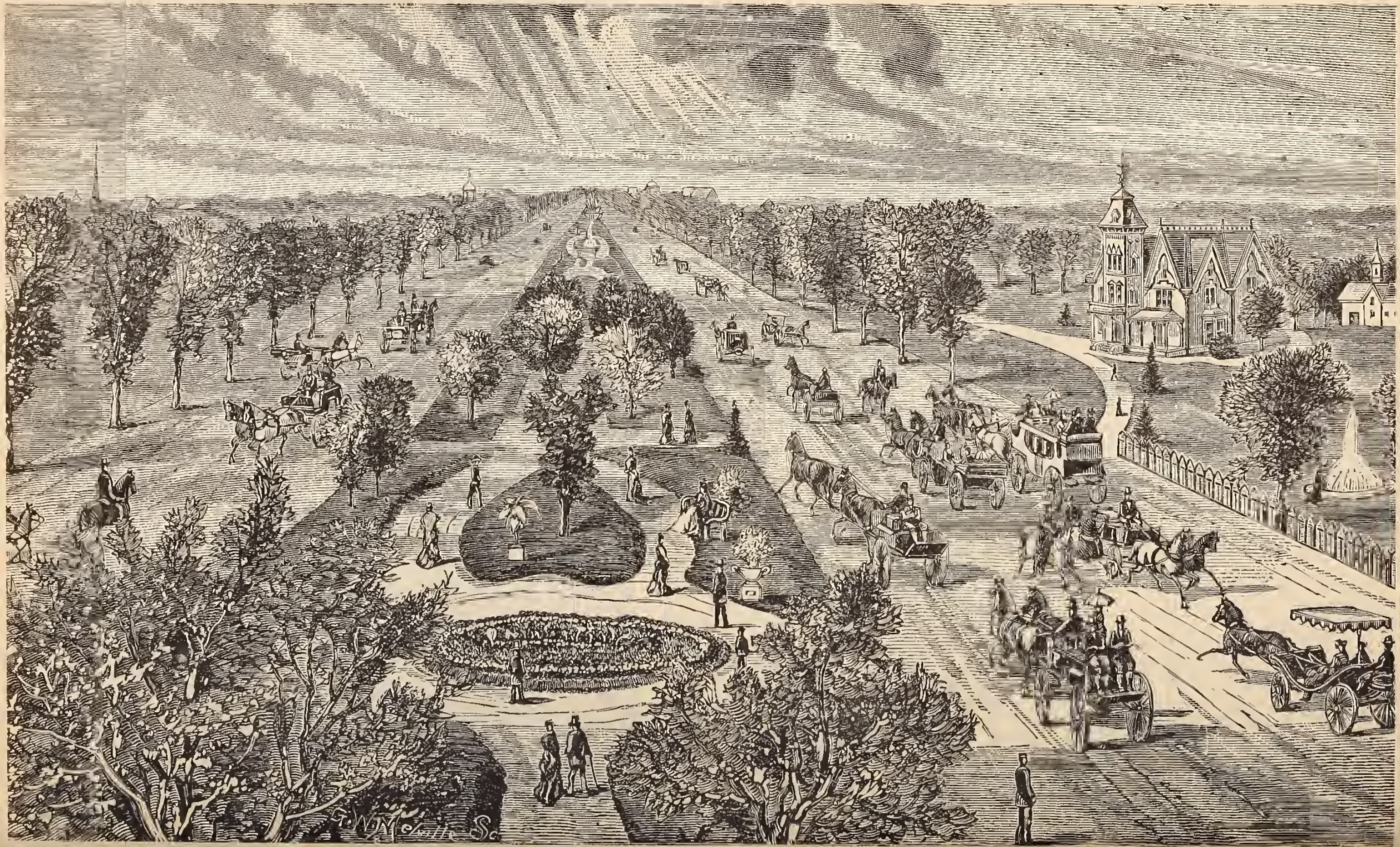


Fig. 180. *PALMER HOUSE CONSERVATORY.*


FULLERTON AVE
BOULEVARD
NORTH AVE
CHICAGO AVE
WATER WORKS
LAKE CRIB
MADISON ST
TWELFTH ST
NEW WATERWORKS
22ND ST
31ST ST
ILL & MICH CANAL
CITY LIMITS
39TH ST
41TH ST
PARK BOULEVARD
55TH ST
63RD ST
MAP OF
CHICAGO
ITS
Parks and Boulevards.

land has been reclaimed or filled up 3,531 feet in length, and from 300 feet wide at the north end to 400 feet wide at the south end. This strip of made ground has been improved by the park commissioners and laid out to correspond with the small portion of land existing before 1871, and which had been laid out in walks through the green lawn. This Park is, without doubt, the most popular resort for pedestrians of any about Chicago, and is also convenient to the more densely peopled portions of the town, and the comfort and enjoyableness of the place, together with the charming and picturesque view of the lake, is admired by everybody. The city has assumed to hold the land in trust for the adjoining lot holders, and through the city council has, by ordinance, conveyed to the South Park commissioners the rights of both Lake Park for park purposes and Michigan Avenue for a grand Boulevard as far south as 39th street, where by going east a short distance it reaches Oakwood Boulevard. But nothing has yet been done to change Michigan Avenue, and as the title to Lake Park is claimed by the Illinois railroad company, the adjoining property owners and the city, it is quite doubtful if the improvements are finished for some time yet.

From Lake Park we will drive south choosing either of the beautiful avenues for our route, viz.: Michigan avenue, which runs along the entire western face of the



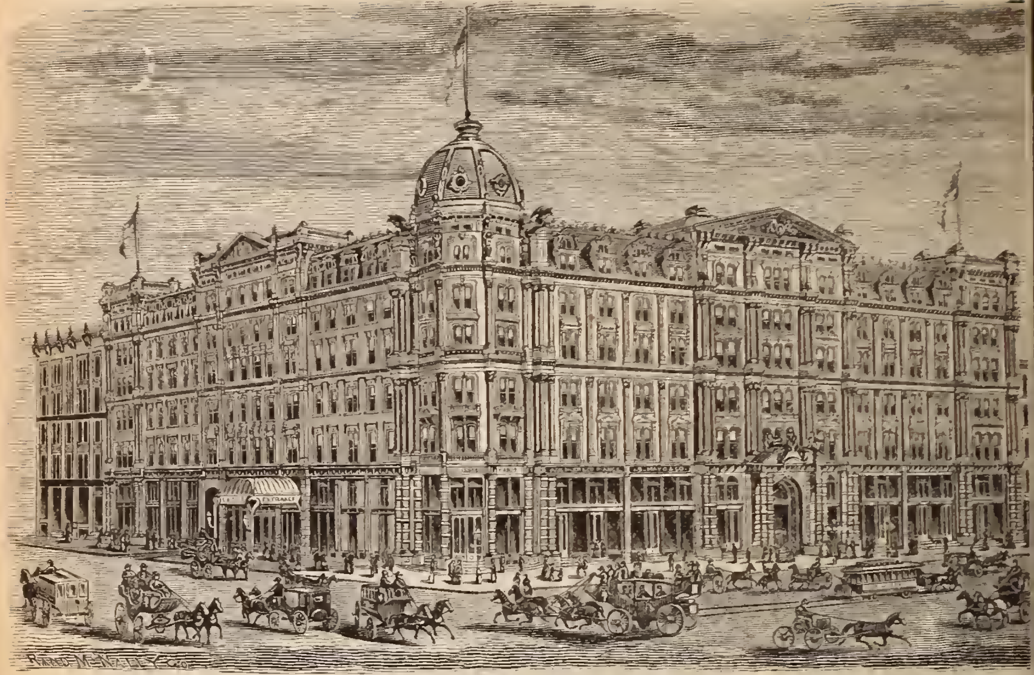


FIG. 183. *Palmer House, Chicago, Illinois.*

park, and southward an indefinite number of miles into the unimproved prairies south of town; or Wabash, Indiana, Prairie, Calumet or South Park avenues, which are lined with their palatial residences to the old Douglas homestead, now known as Cottage Grove, a distance of nearly four and a half miles from the Court House. Here we meet with the first of the very extensive boulevard system of Chicago—the Grand Boulevard,—but we will only follow this one about one-third of a mile; when we shall come to Oakwood Boulevard, running east and west, and will then cross over to Drexel Park or, as it is now called, Grove Parkway. (Fig. 182.) These boulevards are each two hundred feet wide, except at the junction of South Park, where they are four hundred and fifty feet wide, will take us to the South Park, nearly two miles to the south of us; but as we wish to study the effect of landscape gardening, where foliage and flowering plants form the feature, we will change over to Grove Parkway for our drive. This is devoted exclusively to pleasure, no heavily loaded teams being allowed on the drives. It is, *par excellence,* the boulevard of Chicago, and is arranged after the style of the avenue l'Imperetrice of Paris, which is the finest boulevard in the world. These boulevards land us at the threshhold of South Park, one being at the northeast, the other at the northwest corner of the Park. The map of Chicago, its parks and boulevards, on page 40 will be of material assistance in following the descriptions here given.

South Park is really two parks, with a broad avenue connecting them together. The one we shall first visit is designated the West Division and contains about five hundred acres of land laid out in charming drives and walks through the green, grassy lawns; while directly east one and one-fourth miles lies the Eastern Division of South Park stretching along the lake shore for a mile and a quarter. This one also contains about five hundred acres, or both together contain 1,055 acres of land, through which are already fourteen miles of interior drives, and thirty miles of solid gravel walks; while fountains, miniature lakes, groves of shade trees and masses of ornamental shrubbery make it one of the most delightful of resorts; a real fairy land. From near the central western border of the western division of South Park, commences Pavillion Parkway, a broad boulevard or drive, running directly west for nearly five miles, then turning north, following Western avenue roadway, is already completed to old Brighton Park (now abandoned), but will, when finished, reach Douglas Park, two miles further north and west. Douglas Park lies to the southwest of the town, and about four miles from the center of the city. It is in the shape of a lengthened square and contains two hundred and thirty-three acres of land beautifully laid out with drives, walks, lake, ponds, fountains, rustic bridges, rustic houses, music stands, &c. From the western side starts Douglas Boulevard, running one mile west, then north nearly a mile, and joins Central Park at the southwest extremity. Douglas Boulevard has a central planting space of one hundred and twenty feet wide, a drive on either side of forty feet, twenty-five feet for sidewalks and trees, making two hundred and fifty feet in width. Central Park is a mile and a half long, and one-third of a mile wide, with an arm or extension half a mile long and one-third of a mile wide along its eastern side, and containing two hundred and thirty-six acres. This Park is directly west of the city, and the main gateway, which is on the east side of the park, is at the western terminus of Washington street, and about four and a half miles from the assumed center of the city. (Since this article was prepared an arrangement has been effected whereby West Washington street, from Central Park to Union Park, a distance of nearly two and one-half miles, will be immediately converted into a boulevard. This will furnish a most excellent approach to Central Park.) At the northeast corner of this park, Central Boulevard commences, running north one-fourth of a mile, then east nearly a mile; then north again three-fourths of a mile until it reaches Humboldt Park. Central Boulevard is graded fifty feet wide for a central drive, with two side drives each twenty-five feet wide, while upon either side is an equestrian roadway thirty-one feet wide, and outside of all are the two sidewalks for pedestrians, each eight feet wide; the whole two hundred and fifty feet being shaded by six rows of tall elms. One small park (North Central Park), and one square (Sacramento Square) mark the corners where the boulevard changes its course, and upon approaching Humboldt Park, the boulevard is extended to four hundred feet wide for nearly half a mile. Here will stand a monument of Baron Von Humboldt, with flower stands, fountains, &c. Humboldt Park is nearly a mile long by half a mile at its northern end, but only half that at the south end. It contains 290 acres of land, which is artistically laid out in walks and drives through the lawn, with a large lake forming the central portion of the park. From the north center, Humboldt Boulevard runs north about a mile, passing through Palmer square, turning west one-fourth of a mile, then north again until it reaches Logan square, then turning east, reaches out for a long drive to the north end of Lincoln Park on the lake shore four miles away. Humboldt Boulevard is two hundred and fifty feet wide, and will be arranged similar to all the others when completed. Lincoln Park, the most complete of all the parks, stretches out nearly two miles in length along the lake shore, and is a little over half a mile in width, containing three hundred and ten acres of land.

The lake shore drive, the great north side boulevard, extends along the lake front of Lincoln Park from the Water Works to Lake View, (village) and vies with South Park boulevards in its superior road-bed, its fine views and its gay equipages during pleasant weather. The lakes, walks and drives of Lincoln Park are also charming.

These parks and boulevards are yet far from being complete, but when finished will present the finest system of parks, all connected together by grand boulevards, in the world, and with the single exception of the short distance from the water works on the north side of the river to the exposition building on the south side of the river, the boulevards and parks will extend entirely around the city, with the finest drives in the world.

Within the city are several small parks, but as they are only breathing places for the city, and are too small to exhibit the charming powers of the landscape gardener's art, we will only casually notice them. First, Washington Park, near the water works, contains about three acres and is well shaded by large stately trees. Wickes Park, on Michigan avenue, three miles north-west of the court house, contains five acres. Union Park, one and three-fourth miles directly west of the court house, contains twenty-three acres; while Jefferson Park, two miles south, contains only six acres, and Vernon Park, three-fourths of a mile still further south, only three acres.

A CURIOSITY NATURALLY.

Last October, while returning to my camp on the Pansegunt plateau in a very cold snow storm, my attention was attracted to a young pinus flexilis tree. It was about eighteen feet high, and, as well as I could judge, six inches in diameter one foot from the ground. About two feet from the ground it forked, and each fork has wound itself around its fellow for two feet, going around once and a half in that length. It resembled two bitter sweet vines that had twisted around each other in growth; above the point where the two were twisted the two prongs ran up straight and independent. I was surprised, last spring, to see a penstemon with wood as solid as oak growing out of the crevasse of the rocks; but what I have described above was more surprising to me. I am, A. L SILER.

Ranch, Utah.

THE BIG TREES OF INDIANA.

B. WILSON SMITH, LA FAYETTE, INDIANA.

WE read with great interest the reports of the big trees and the curious trees of other countries and States, not once dreaming that there are those in our own State remarkable for size and character.

CHESTNUT TREES.

In Jackson county are to be found the largest Chestnut trees in the State. There are veritable giants located about three miles southeast of Seymour. I measured one of these four years ago, which was twenty-two feet and four inches in circumference, two feet above the ground. I estimated its height to first limb at about seventy feet.

SASSAFRAS TREES.

The sassafras attains a remarkable size on the Lower Wabash. One of these, one mile and a half west of Springfield, the old county seat of Posey, is full three feet in diameter, and for more than sixty feet, clear of limbs and knots; its height, in full, is eighty-five feet.

CATALPA TREES.

In this same region and along the Wabash, the catalpa grows tall and slender, and in great abundance. It is used for both fence rails and posts; especially for the latter, and stands next to the black locust in its durability.

SYCAMORE TREES.

The giant tree of Indiana, as far as I know, is a sycamore in the White river bottom, not far from Worthington. It is said to be forty-eight feet in circumference, and has a solid trunk. At a height of twenty-five feet it branches into three or four limbs, one of which must be more than five feet in diameter. The tree is not quite round but is still quite regular. It fills the mind with awe to stand by and contemplate it. It looks like a veteran come down from the ages agone.

YELLOW WILLOW.

The yellow willow, though common as any other tree in this latitude, does not usually attain a large size. Trunks two and three feet in diameter are among the largest, yet there is a very remarkable one on my farm in White county. I planted it myself—stuck a twig in the ground—in the month of April, 1848. Last summer I measured the tree, and its circumference was thirteen feet and four inches, and the extreme spread of the branches sixty-six feet. In an extensive acquaintance reaching through all the counties of the State but two, this is the largest yellow willow I have ever seen.

VINCENT VAN DER VINNE.

On the 14th of April, 1879, died at Haarlem, at the venerable age of nearly 80 years, Mr. Vincent van der Vinne, a florist to whom all growers and amateurs of Hyacinths and Tulips are greatly indebted for his raising of new sorts; so that his name is worthy to be mentioned. Mr. Vincent van der Vinne was born November 22d, 1799, at Amsterdam, where he was brought up by his parents for an apothecary. About 1822 he gave up this career, and went into the cultivation of Flowerroots at Haarlem, where he soon excelled for his beautiful and *true* stock of late Tulips, until 1862, when he gave up his business. He was the renown specialist for this valuable article. During these forty years he raised from seed most of the best double Tulips, which are,or are to come, in the trade, and many sorts of Hyacinths, which have taken the lead of the trade, being nearly all exhibition sorts. To him we are indebted for the following white Hyacinths: Grandeur a Merveille, LaGrandesse, La Neige, L'innocence; among the red,Lina,Princesse Louise; among the blue, Czar Peter,de Candolle, Lord Melville, and Prince of Wales, certainly all together too many sorts to be all mentioned. As a specimen of the great value of his novelties I may relate, that there were sold in the spring of 1879, twenty-one roots of the double red Hyacinth, Princesse Louise,for the sum of £38, 8s, 5d, being nearly the highest price which was paid for a new Hyacinth in the last ten years. From 1862 until 1879 he enjoyed a well deserved rest after a busy and useful career, and had the pleasure to be respected by all who knew him for his stainless life.—C. E. Van Goor, Haarlem, Holland.

NATIVE FRUITS,

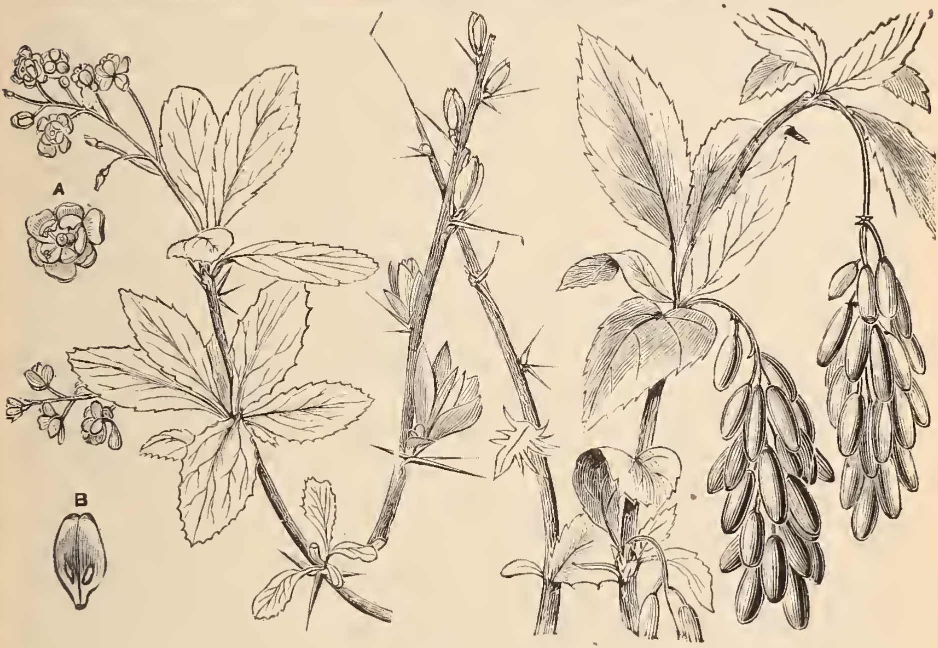


FIG. 184. *Berberis Canadensis.*

BERBERIS CANADENSIS. PURSH.

AMERICAN BARBERRY.

IT will hardly sound appropriate to the ears of a Southern New England farmer to tell of the beauties and value of one of the greatest pests on their farms, the common Barberry, but to the Horticulturist there are nevertheless many points of excellence in this, to them, noxious shrub. To the vegetable physiologist also there are many points of value, which we will briefly notice, and only regret our limited space to do the subject justice.

Sir Joseph Paxton enumerates 59 species of Barberries, exclusive of the 5 or 6 recently described North American species, a portion of which, however, should be separated from the old *Genus*, (Berberries,) and placed in one of the 2 new genera or subgenera, viz: *Trilicina* and *Mahonia*, all of which have evergreen and pinnated leaves.

As *B. canadensis* is the only one we specially wish to treat of in this article, we will leave all other species for a future consideration. According to authors the name Berberry, or as it is commonly called Barberry, was adopted by science (and horticulturists) from the Arabic name as applied to this particular genus of fruit, for the closely allied species, *B. vulgaris*, is one of the commonest fruits of Southern and Western Europe, Northern Africa and Asia Minor. It is usually thought to be the fruit referred to by Pliny, who says: "There is a kind of thorny bush called Appendix, for that there be red berries hanging thereto, which be likewise named Apendices," (Book 24, chapter 13). They are essentially a temperate zone genus of shrubs, not having been found within the tropics of South Africa, Australia or New

Zealand, and only found in tropical South America on high elevations, (Andes Mountain.) It is, however, found at the southern extremity of South America, as well as as far north as latitude 56° in North America.

Prof. Macoun, of the Canadian Government Survey, reports *B. canadensis* on Vancouver's Island, British Columbia, Peace River and Athabaska countries, Saskatchewan Plains and Province of Ontario. He also reports *B. precox*, an allied species, as in British Columbia, Saskatchewan Plains and Labrador. They thrive in any thin, light, or almost barren soil, and when allowed to grow naturally (in a spreading bunch,) form very ornamental oval or circular thickets, usually from 5 to 7 feet high, and in autumn when in fruit are decidedly a handsome lawn ornament. The fruit from these natural growth bushes are of necessity small and very sour or even bitter, but if the shrub is planted in good soil and also *trimmed up*, i. e., all the suckers kept cut away, it will not only make a tall symmetrical and graceful growth, but also produce larger and sweeter fruit in great abundance. In other words, cultivation works the same mysterious wonders in the Barberry as in nearly all other kinds of fruits. Throughout all the mountainous portions of Eastern North America the common Barberry grows in more or less abundance, and until within the past few years was thought to be all of one species, and that one species, the old European *B. vulgaris*; but Dr. Asa Gray says there are two distinct species growing in North America, *B. canadensis* a native, and *B. vulgaris* the foreign species, which so strongly resembles it, and which must have been introduced by the early colonist. They, however, appear so similar to the average horticulturist that a description of one species will almost answer, at least to a large extent, for the other. The bush, when well established, throws up from the base numerous tough, spiny shoots, covered with a gray or whitish bark. The leaves are thin, deciduous, obovate toothed, ciliate on the margins, of a pleasant acid taste, and have been used for salad, and of a pale green color. But here the physiologist finds food for study. Associated with the leaves are also seen a few short, stout thorns, which we are told are only one condition of the same. How very strange, but let us investigate the subject a little.

The foliage first produced on the young growth is apparently nothing more than a series of sharp prickles at the nodes where the leaves should be. These seemingly useless, horny spines are in reality the primary leaves, and appear first on all the new growth and serve as a protection to the tender shoots while young. We will often find in examining them more carefully that the spaces between them at the bases are filled to a considerable extent by a membranous web of vegetable tissues, similar to the portion between the veins of an ordinary leaf. In others, however, it is scarcely visible, while in some it is not seen at all. In the subsequent leaves, this central spine runs the entire length of the leaf, as the mid-rib, and extending beyond the leaf margin still retains its sharp thorny points. The side prickles also (being multiplied by two as a rule) correspond to the leaf veins of the subsequent or secondary leaves, which also extend beyond the leaf-margins. Fig. 184, from Gray's Botanical works, illustrates the point in question much better than words can do. These prickles are not simply thorns in the ordinary meaning of the word, as applied to plants, but are an essential portion of the structure of the branch while young, and form the nucleus or starting point of the future leaf; or to make the idea as plain as possible, we will say that the leaves all start from the bosom of these thorns. The bud of the secondary (true) leaves, starting from the centre of the primary ones, break up through the axil of the primary leaves, and as the particular function of these spinous leaves are now completed, they mature, so to speak, and drop off during the second year.

From the midst of the cluster of leaves of the last year's growth are produced during May, a curious but inconspicuous drooping stem (raceme) of yellow flowers, about three inches long. There are, however, many very interesting features about these flowers, but as we do not wish to be tedious we will only notice a few of them. At the base of each of the six petals are two parallel, oblong, yellow nectariferous glands. Pressed between these glands, and opposite to the middle of the petals, are the six stamens in a recumbent position, and back, close pressed upon the petals, when the flower first opens, but under the influence of the sun and the evaporation of some of the moisture from the glands, they soon free themselves with a sudden jerk, striking the stigma, dislodging some of the pollen and completing its fertilization; and, after remaining in an incurved position a short time, they gradually assume an erect position during the remainder of the period of blooming. The same effect is produced by irritating the stamen with a fine point; or, if it is brushed by an insect near the base of the inner side. The object of this motion seems plainly to be the dislodgement of the pollen from the cells of the anther, and its projection upon the stigma, (Gray's Text Book, page 346). In wet weather, when the filaments have lost their elasticity, the phenomenon is scarcely perceptible. The same result attends the experiment of applying corrosive sublimate to the filaments; they become rigid and brittle and lose their irritability. On the other hand, on the application of narcotics, as prussic acid or belladonna, the irritability is destroyed by the filaments becoming flaccid and relaxed.

The berries hang in a pendulous raceme, to correspond with the previous bunch of flowers, are of a bright red or scarlet color, oval or oblong, and each one contains from one to nine oblong, hard seed. The berries contain free malic acid, which form a very pleasant jelly, jam or preserves. It is sometimes candied, and, when green, is also sometimes pickled in vinegar. In all our correspondence we fail to find any locality in America outside of New England, where the fruit is employed as an article of food, and in New England it is only used when other fruits are scarce, or among the poorer class of people. The reason for which may be briefly stated in the fact that the fruit is too acid to use in its natural state, and as we have so many other fruits requiring so much less sugar to overcome the large quantity of acid, there is no economy in its use. It is quite probable, however, a valuable flavoring extract could be obtained from these berries, which perhaps, may some day be a popular article of manufacture and merchandise. The only place in Europe where they are much used is in Rouen, France, and their Berberry Preserves have a world-wide reputation.

The wood and inner bark of all species (including natives of India and South America)are an astringent and of a yellow color,and furnish a yellow dye,and together with the root contain a principle analagous to that of rheubarb, called in chemistry, berberine, which is a cathartic. The roots, boiled in an alkaline ley, yield a yellow dye used in Poland for coloring leather. The bark of the barberry, of which a purgative decoction was formerly made, was much celebrated as a remedy in jaundice, but it has long since been discarded from modern practice, as its claims as a medicinal plant only rested upon the doctrine of similitude which assumed that nature, when she made a plant, impressed upon it some sign to point out its curative properties to those who properly sought such knowledge. In this way, it was supposed, that, as the patient's skin in jaundice is yellow, so the yellow bark of the barberry indicated it as a remedy for this diseased condition. (Treasury of Botany), The young, acrid, astringent leaves were used to strengthen the gums. *B. Lycium*, the *Lycium indicum of Dioscorioides* is used to this day in India for ophthalmy.—(Hooker).

Being so very hardy, and the new growth covered with sharp spines, it is well adapted to plant for hedges, for which it is used to a limited extent, and would be still more so but for the idea among farmers that it produces the blight or rust to corn, rye, wheat, &c., if grown in its proximity; for which reason chiefly New England farmers desire its extermination., Scientific investigation has proven very satisfactorily that the fungus called smut, and the rust of the barberry, are the same, often, however, under conditions to present different forms; but the presence or absence of the barberry bush will probably have very little influence on the disease (smut) on wheat, the conditions of the season without doubt being the primary cause.

LARGE GOOSEBERRIES.

MR. Shearn, of St. Leonards, writes: "I saw in one of your late issues that thirty-seven gooseberries (sent to one of your correspondents) weighed one pound, and some measured four and one-half by three and one-half inches; it may be interesting to you to know that Flowerdale is not the only place that can produce large gooseberries. Out of a small basket of gooseberries we had gathered, nineteen weighed one pound; one measured five by five inches; two ditto, five and one-fourth by four and one-half inches; two ditto, five by four and one-fourth inches. The bushes are only three years old. Four weighed over a quarter of a pound." But we have received from Mr. Robert Kean, the well known nursery gardener and seedsman, of the Sandhill, a sample of gooseberries which look like small apples, and top everything yet recorded. There are rough red and white, and smooth red and white, and sixteen of them weigh one pound, one ounce. Can any of our readers beat this sample?

"An Old Settler," in your issue of Saturday last, speaks of a basket of gooseberries being sent from the Flowerdale, thirty-seven of which weighed one pound. I saw a splendid sample a few days ago in the possession of Mr. Charles Glenn, grown at his father's garden at Entally, it took twenty-four to weigh a pound. In fact I weighed them myself, and can speak authentically. This puts Flowerdale in the shade a little.—*Launceston*, *Tasmania*, (*Australia*) *Examiner*.

THE JAPAN QUINCE AS A FRUIT TREE.

BY E. Y. TEAS, DUNREITH, INDIANA.

IT is comparatively recently that I have become aware of the fact that the Japan Quince (*Cydonia Japonica*,) produced fruit of any value, or in any considerable quantity. I purchased a place in 1864 that had growing three or four plants of this Quince, of both the common scarlet, and also the pink flowered varieties. These plants were 9 or 10 feet high, and about 6 feet across the clump of shoots. Although these plants bloomed most profusely, they only occasionally perfected any fruit, and what little there was was very small, of a tough, woody texture, with a few seeds, with almost no flesh at all resembling a useful fruit. I had cultivated this plant as a flowering shrub for perhaps twenty years previously, without ever expecting to see valuable fruit. Recently I have met with displays of the fruit which surprised me, on account of its size and abundance, and also on account of its superior quality. I have seen specimens 2 by 3 inches in diameter, with a fine fleshy texture, abounding in a rich, aromatic juice, as tart and very much like a lemon, readily producing a jelly of the finest quality and most delightful flavor. The fruit when baked or stewed becomes very fine, and serves admirably to flavor stewed fruit, apple butter, &c.

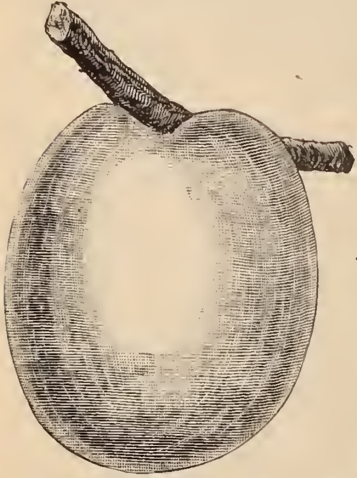


FIG. 185. *Cydonia Japonica, natural size.*

For flavoring other fruits in cooking, this variety of Japan Quince is well worthy of culture, and as a flavoring shrub, this is equal to any other variety that I have seen.

The largest specimens yield from 50 to 100 seeds each, and the seedlings are recommended by some as a stock for dwarf Pears. I doubt, however, whether they will prove adapted to this use. I have a number of plants producing the finest fruit, and intend, by selecting seed from the best specimens, to make further improvements in the fruit.

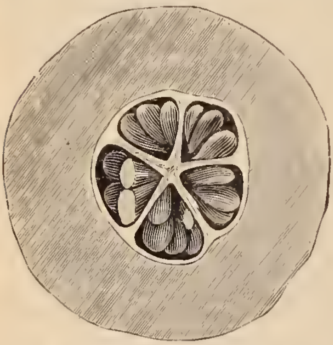


FIG. 186. *Cydonia Japonica, cut across.*

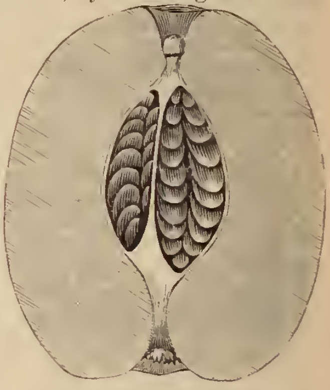


FIG. 187. *Cut lengthwise.*

Mr. Maule, a Nurseryman in England, introduced a few years ago, a variety of Japan Quince that he sold under the name of "*Pyrus Maulei.*" I cannot learn from descriptions I have seen of this fruit, that it is superior to some specimens grown here. I hope, however, to fruit this variety also, and compare it with those I have already. I invite the attention of others to this plant as one capable of great improvement, and one from which we may expect valuable results.

[The specimens from which the above illustrations were made, was given me with a number of other and larger ones after the first of January. All the largest and finest specimens were too far decayed or withered for the artist to form a correct idea to make a picture from. Fig. 185 represents the fruit, natural size and form. Perhaps we should say these choice and ornamental shrubs are usually given in Nurserymen's Catalogues as *Pyrus Japonica*, but the true *Pyrus* comprise the Apple, Pear, Service Berry, etc., while the Quince was named *Cydonia* from the first specimens obtained by Europeans; and which were popularly attributed to be natives of *Kydon*, in the island of Crete. *C. Japonica* was first introduced into Europe in 1815. —ED. BOT. IND.]

THE CHERRY.

CERASUS VULGARIS. C. SYLVESTRIS.

CERISIER.—French. KIRSCHENBAUM.—German.

BY L. S. MOTE, WEST MILTON, OHIO.

THE Cherry is a fine, graceful tree, cultivated for its edible fruit, and holds an important place in our kitchen service in the varied kinds of pies, tarts, desserts, &c. It is a native of the milder portions of Asia, and was brought by the Romans into Italy, from Cerasus, a town in Pontus, a good many years prior to the Christian era, (hence the Generic name, Cerasus). It was carried from thence to all parts of Europe, and other places as civilization advanced, and reached our shores in a very early period of its settlement by the emigrants from the eastern hemisphere. It has been greatly improved in the last hundred years, by skillful horticulturists, in the reproduction of many choice varieties from hybridized seed. Nature has also done her part in furnishing some few noted kinds in *chance* seedlings. Even our common-cultivated Cherry tree, when in full bloom in the Spring of the year, is very ornamental upon the lawn or house plot; to say nothing about the fancy flowering sorts.

Horticulturists have classed them into two grand divisions. The first are the sweet kinds, comprising the Mazzards, Hearts and Bigarreaus. Secondly, the tart ones, including the Dukes, Morellos and their kinds. The fruit of our common wild black Cherry (*Cerasus Virginiana*) is not unfrequently used for the same purposes that the cultivated sorts are, (their medical properties being a sedative tonic.) There is a tree in this vicinity that produces berries twice the usual size of this kind, and are better flavored; under this class we have the *C. Serotina*, or Choke Cherry, and the *C. Pubescens*, or Sand Cherry; also the *C. Mahaleb*, or wild Cherry of France, much used by nurserymen for stocks latterly for budding purposes, and some others not enumerated. It is not our purpose at this time to review in detail, or speak of the merits or demerits of the many, but only of a few that we have had under culture of the well known varieties. Our changeable climate often makes sad havoc among the larger and finer kinds, their rapid growth making so much soft succulent wood, they fall an easy prey to the cold cutting winds of our winters, thus betraying their primitive clime. Our nurserymen are thus compelled to grow almost exclusively the more hardy sorts, coming under the head of the second class.

The Black Tartarian is a very large luscious old variety, but too tender to be depended upon in this parallel. (This and the Yellow Spanish, Governor Wood, we have had a full inch in diameter, frequently on our trees.) Governor Wood is the best and most hardy of all of Prof. Kirtland's seedlings that we have tried. Black Eagle is a very fine Cherry in its class and tolerably hardy. Early Purple Guigne is the earliest of all here, excellent flavored (for an early,) and hardy. Many of our seedlings raised from the foregoing kinds, were too tender for our climate; a few appear more hardy, but are not equal in all respects to the parents—one bears a dark red fruit and is equal or better than any Honeyheart (of the second class.)

We have two varieties of Dukes. The May Duke, although large and fine, is a shy bearer and rather tender. Another, from Philadelphia, Penn., a little less in size, ripening at the same time, as good flavored, *more productive* and hardy, is taking the place of the first.

The Common May, May of the West, Early Richmond, (erroneously) *Cerasus M. Præcoce*, is a very early hardy Morello, only "second rate" in flavor, but cultivated all through the West on account of its hardiness and early ripening. Early Richmond (Virginia May, Kentish Red, etc.,) resembles the foregoing, and ripening about the same time; is rounder and some darker colored, and more solid flesh and richer fruit than the May.

The Dyehouse is an extra early Morello that originated toward Central Kentucky, with an old gentlemen, (whose name it bears,) over 30 years ago, but only within a few years past has it been brought to public notice. It is claimed to be the earliest, best and hardiest of its class, but we cannot vouch for this as we have none in bearing.

Kirtland's Large Morello is a real improvement on the old common kind; about a third larger and a better bearer, and some earlier.

Note.—Our experience with the May Cherry, in the reproduction of seedlings, has not been as satisfactory as desired. We have only a few of them left for further cultivation. We had them of various *qualities, sizes and times of ripening*. While some were sweeter and earlier, they lacked in productiveness, and a few so nearly resembled the parent every way that common observation would fail to see any difference. We have one exception, that the fruit is some larger. Will try it further. Those seedlings have been in bearing 10 or 12 years.

B. CASE
RICHMOND
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RICHMOND
FROM
J.V. & S
LONDON

NEW & RARE PLANTS

[We would request any one having new or strange Plants, to send us a notice for publication in these columns.]

LILIUM PARRYI. WATSON.

DURING the Summer of 1876, Dr. C. C. Parry had the good fortune to find in Southern California one of the finest of all the California Lilies yet discovered, and as the bulbs are now being introduced into cultivation, we have had a picture of the bulb made, which we present to our readers this month. It is unlike any other bulb in form, and can not be mistaken when once seen. It has a stronger resemblance to *L. Superbum*, Fig. 189, than any other, but still does not approach it. The flower is trumpet shaped, in the way of *L. Longiflorum*. The scientific description as already published may be of interest:

"Bulb somewhat rhizomatous, of numerous crowded scales, fleshy and jointed, about an inch long, the upper joint broadly lanceolate; stem slender, glabrous, two to five feet high, 2-10 flowered; leaves usually scattered, occasionally the lower ones in a whorl, linear, oblanceolate, four to six inches long, and half an inch wide or less, mostly acuminate; flowers horizontal, pale yellow, sparingly and minutely dotted with purple; segments three and one-half inches long, and five or six lines wide, with long, narrow claws, slightly spreading from the base; stamens and style a half inch shorter, equal; anthers oblong, brownish, three lines long; capsules narrowly oblong, acutish, two inches long by half an inch in breadth.

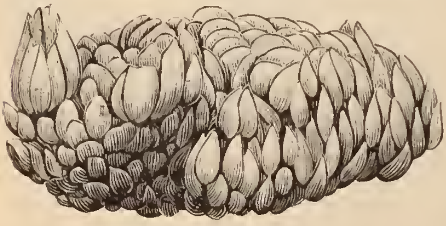

FIG. 188. *Rhizoma of Lilium Parryi.*

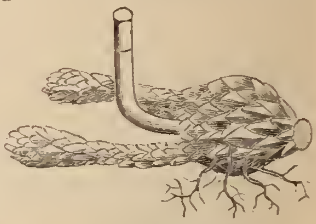

FIG. 189. *Rhizoma of L. Superbum.*

"Of the section *Enlirion*, to which also belongs the Californian *L. Washingtonianum*. It is distinguished from the latter especially by its small bulbs, with jointed scales, its more scattered and narrower leaves, its smaller yellow flowers with less spreading segments, and its longer, narrower and acuter capsules."

NEW ECHEVERIAS.

IT will interest a large number of the readers of the INDEX to know of the new hybrid Echeverias raised and now offered for sale by Ferdinand von der Heiden, of Hilden, Germany. We give below an abridged translation of his descriptions. They are:

ECHEVERIA CINERACEA. V. D. H.

A low growing plant, but spreading out broadly; leaves green, with silvery-white spots around the edges, underneath spotted with red.

ECHEVERIA CYANEA. V. D. H.

A low growing variety, with leaves in a compact mass like the petals of a full blown Rose, of a blue-green color with a light rose shade.

ECHEVERIA DEALBATA. V. D. H.

A thrifty growing variety; leaves white with a rose shade; flowers small, yellow and red, and borne on stems ten to fifteen centimeters high.

ECHEVERIA GRACILLIMA CRISTATA. V. D. H.

Leaves white, long, with the edges tinted red.

ECHEVERIA HERBACA. V. D. H.

Plant of low growth; leaves of a dark green color; flower a golden yellow, flushed red, and borne on short stems.

ECHEVERIA MUCRONATA GLAUCA. V. D. H.

Plant of the habit of the well known variety, *E. Mucronata;* leaves blue-green, edged with carmine-red.

ECHEVERIA PULCHELLA. V. D. H.

Plant a rank grower, rosette shaped; leaves broad, of a whitish color with rose colored points scattered over its surface; flowers yellow, borne on stalks from forty to fifty centimeters high.

ECHEVERIA VIOLACEA. V. D. H.

Plants of medium size; leaves of a blue green color; flowers red and yellow, very showy and handsome, and produced on a stem from thirty to forty centimeters high.

BEGONIA DISCOLOR—REX. Bruant.

ONE year ago (April, 1879,) we published in the Botanical Index M. Bruant's description of his new hybrid Begonia,—Discolar Rex. Now we have the privilege of describing the balance of the set produced by M. Bruant and his very successful propagator, M. Svahn. The plants, without doubt, will prove of great value for house culture, combining as they do in the same plant a flowering and foliage specimen. The descriptions are those accompanying the plants:

BEGONIA MADEMOISELLE MARGUERITE SVAHN.

Plant bushy, with fine foliage, leaden gray, leaf veins deep green, underside reddish-purple, wholly purple in the open air like the magnificent variety "Madame Svahn."

BEGONIA L. B. CASE.

Plant very vigorous, forming rapidly a fine bush, appearance and vegetation of the "Discolor;" beautiful foliage of silver gray, deeply tinted with rose, the young leaves entirely a vivid rose, the adult leaves passing to deep purple, leaf veins deep bronze green, early to flower; a superb variety.

BEGONIA PRESIDENT H. BALARESQUE.

Vigorous and magnificent plant, of a very beautiful appearance, leaf large, dark bronze green spotted with points of silver gray, rose tinted, spotted with rose in the open air, under side dark purple, a new design. Flowers very large clear rose, bud vivid rose, very early to flower.

BEGONIA COMTESSE LOUISE DE KERGOLAY.

Of very remarkable growth, plants large, bushy, leaves very large, resembling some of the foliage varieties, silvery white, reflecting a metallic brilliancy, leaf veins deep green. Flowers large, of a pretty rose-salmon color, very beautiful variety for growing in pots.

BEGONIA MADEMOISELLE ALPHONSINE DE LA RUE.

Plant spreading, well bushed, of rapid growth, leaf longish, of tender green all dotted with white, disclosing only the design (or pattern) of the leaf veins; flower vivid rose, abundant; variety very hardy, for open ground and of rapid increase.

The remainder of the set are:
Madame Svahn.
Souvenir de Dr. Weddell.
Edouard Andre.
Lucienne Bruant.
A. Carriere.
W. E. Gumbleton.
Comtesse Gabrielle de Clermont-Tonnerre.
Marquerite Bruant.

M. Bruant has still more varieties that will be offered to the public in due course of time.

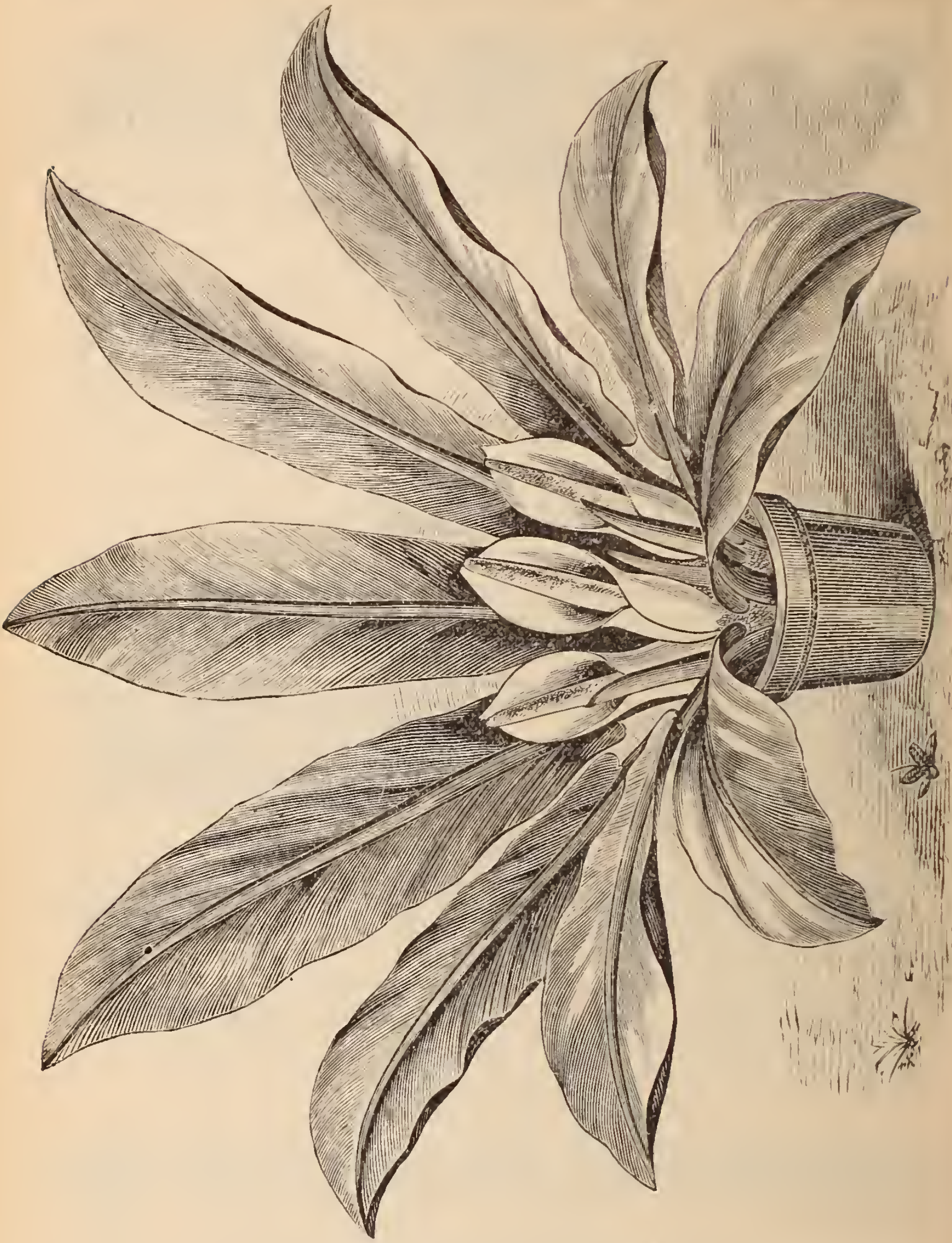

FIG. 190. *Anthurium Dickii.*

ANTHURIUM DICKII.

AMONG the new plants offered for the first time this year is the above named Anthurium, named in honor of one of our most worthy Florists, John Dick, of Philadelphia. The leaves are long, stiff and supported their entire length by a very strong and large mid-rib. The flowers have a charming fragrance, similar to that of *Magnolia Conspicua*, only more delicate. The centre of the flower is of a magenta color and margined with creamy white, while the back is a delicate pink color. As Mr. Dick's stock is quite limited, only those who apply soon will have the good fortune to secure a specimen.

CORRESPONDENCE

[We solicit the privilege of publishing extracts from correspondence, of interest to the general reader. Correspondence upon Botanical subjects respectfully solicited.]

Ghent, Belgium, March 7th, 1880.

L. B. Case, Esq., Richmond, Ind.—My Dear Sir: The rude winter of 1879–80 has oppressed us with a severity which we shall remember for a long time. Plants and trees, as well as the people, have suffered everywhere; a great many birds were also destroyed. Belgium does not remember such a cold winter for a century. About the 20th of November winter set in, increasing every day and intermixed with snow; on the 3d and 4th of December the mercury dropped down to 19 centigrades, with a light wind from north to south, and on the 6th and 7th the thermometer marked 21 centigrades, accompanied with a very heavy snow storm, so that the people had difficulty to keep the roads open. On the 8th and 9th of December was the lowest temperature, 26 centigrades! with a southerly wind. I attended myself on this terrible night, and from time to time heard a noise or report produced by large trees splitting open by the intensity of the frost. I have seen one of our finest purple beech, the main stem of which was split from top to bottom. This was the highest degree of cold attained during this winter. Sharp frost, intermixed with snow, continued until the 28th of December, after which it began to thaw and rain, accompanied with a very strong storm wind, which occasioned great damage Moderate frost set in again on the 5th of January, 1880, and continued until February, without interruption. We have had frost during about 3 months. Fortunately, during all the while, the ground was protected by a thick bed of snow, which has preserved all the herbaceous plants, bulbs, etc.; however, the number of trees and shrubs lost is incalculable. Nearly all the standard Roses, also, in some parts, the wild briers in the forests are dead. All our finest ornamental Conifers are killed, such as: the beautiful *Araucaria imbicata*, the grand *Wellingtonia gigantea* from California, *Cedrus Deodara*, *Cupressus*, and some other fine species: *Rhododendron*, *Aucubæs*, *laurus Cerasus*, *Laurus Portugal*, *variegated Hollies*, and many other ornamental shrubs, are also destroyed. Fruit trees have suffered very much, a large portion of which are entirely dead. Some old Pear trees are killed from top to bottom, and Peach, Nectarines, Vines, Apple, and Cherries in general, have suffered very much, and have lost their blossoms, so that we may expect to have scarcely any fruit this season.

In the first days of March the cold had disappeared, and we have nearly every day fine sunshine and a mild air. All the hothouse and greenhouse plants are quite safe. At last, I can say with pleasure, that my complete and splendid collection of Hepaticas and Helleborus are in full bloom, also Crocuses, Scillas, Galanthus, and many other fine bulbous plants; the Hyacinths, Tulips, Narcissus, etc., begin to show their blossoms. I remain, Respectfully Yours,

J. VANDER SWAELMEN.

Monplaisir, Lyon, France, February 12, 1880.

Mr. L. B. Case, Richmond, Ind.—Dear Sir: I have received on the 8th inst. your kind letter of January 26th, and your Botanical Index, as a new token of your kindness. * * You in America are still young Horticulturists. When I went to the United States, in 1860, there was scarcely a flower or an ornamental plant to be seen in the gardens of the environs of New York or Boston; and now Peter Henderson sells yearly a million dollars' worth. And as you are an enterprising and laborious people, you will go on increasing, but it must be by liberal means. It is certain, as you well say, that till now our Horticulturists have an advance in the production of new varieties in some kind of plants, and particularly in Roses and Pelargoniums, and for those the advantage of climate is great. But these can be competed with, as Henry Bennett has shown by his new Roses. . If I were not so old I would make a business of Horticulture, but my age and infirmities oblige me to be idle and lazy. * * * Roses will be very scarce, as you may have seen by my note in *The Garden*, about our very, very severe winter. All the standard Roses are killed everywhere, and those budded low are frozen to the ground, therefore Roses will be scarce next autumn. * * * I am not astonished that you have had a very mild winter, when we had a very severe one, because I have always remarked that we have generally different seasons from yours. Why? Who knows? But I hope that your fear will not be realized, and that you will have a fine Spring and fine Summer, and consequently good fruit crops, and continue to be in that respect a favored nation.

A question which must interest you is the sample post. You know that by the International Convention, of June, 1878, the size of a parcel, sent per post, was fixed at 20 centimeters in length, 10 centimeters in width, and 5 centimeters in depth, but by a new Convention between France and England, it is from the first of this month augmented to 30, 20 and 10 centimeters, which is a great improvement for Horticulturists, although it is not yet sufficient. Do you not think it advisable to claim from your government the same augmentation? As a very free country you ought not to be behind hand.

Do not neglect to write to me when you find anything interesting to relate, and do not fear to trouble me. On the contrary, I am happy to receive your communications. At your service. Yours Truly,

JEAN SISLEY.

HAARLEM, HOLLAND, January 9th, 1880.

Mr. L. B. Case, Richmond, Ind.—Dear Sir: I begin by offering you my very best wishes for the year 1880, and hope it will be a very prosperous one to you. * * * I am sorry to state that I have no Collector, neither do I think that any Florist in the neighborhood has any, for we generally make a specialty of growing Hyacinths which pays us the best. There is, perhaps, room for one or two firms to deal in all those sorts of Cape Bulbs, etc. But, certainly, it would not do for these hundreds of growers we have around here to go in for it. * * * From about November 15th until Christmas we have had such severe cold weather that only a few men remember such cold weather; we have had 20 degrees Fahrenheit, and certainly a lot of things will have suffered badly by it. * * * I shall always be pleased, if I am able, to give you any information you desire, and if there be something, you are quite welcome. Hoping you are quite well, I remain, dear sir, with best regards,

Yours Truly,

C. E. VAN GOOR.

[We are not quite sure of the propriety of publishing extracts from private correspondence, but there are several points in the two preceding letters we wish to bring prominently to notice, and the temptation is too strong to miss the opportunity for using such high authority as M. Jean Sisley. Every person ought to know there is actually very little money value in small plants, or even cuttings from them, even if they are new varieties, when required to be sent over two hundred miles for a market; for it is only by the greatest care and skill they can be *vitalized*, so to speak, after such a long journey. Of course very few could afford to pay express charges on a package of such things, so, therefore, they must be intrusted to the mails, and as the mails are supposed to be instituted for the benefit of all, we see no reason why plants should not be passed duty free, and allowed in packages of such size to be of benefit to all.

We in the central portion of the United States have been favored with unusual mild weather during the past Winter, and it will sound strange to read of such unusually cold and severe weather from any portion of the world, of our latitude. We have been kept informed, however, of the severity of the Winter, not only in Europe, but also on the Pacific coast of North America, by the meterological reports in our daily, weekly and monthly journals, so that these letters are really no great surprise to us. Perhaps we may add that from indirect information from California, Oregon and Washington Territory, very much injury is likely to be sustained by the first crop of 1880, as well as a great loss to the stock raisers and their flocks and herds, from such unexpected cold weather. But while severe cold weather has prevailed north of the frost line on the Pacific coast, a superabundance of rains has prevailed in the southern portion of California, so that the inhabitants of that portion of the world are correspondingly happy over the prospects of good crops during the coming summer, which can only be had after a liberal supply of winter rains.]

MR. J. W. WUNDERLICH, in Frankfort-on-the-Main, (Germany,) states that he has visited districts producing the Roman Hyacinths, and that by information received while there, as well as by later reports in his possession, the facts are established, that in consequence of the drouth in the districts referred to, the bulbs this year will not be quite as large as in former years, and their price will be higher.

SPECIAL CORRESPONDENCE.

ONE of the pleasantest features of journalism is the privilege of collecting facts upon any particular subject and present them to a reading public as information. But some subjects are always more interesting than others, or at least, some subjects are interesting to more people than others; hence, they are more carefully pursued. This is particularly the case with those readers who wish to learn more of the progress of our knowledge in botany, and as we have been fortunate enough to collect a mass of material bearing directly upon this point, since we published our Annual Review of Botanical Progress, Jan. number, 1880, we will devote a small space in this number of the INDEX to a review of the material.

It is a well known fact that all the large new plant merchants live in Europe and employ a large number of collectors annually. Nearly every large house sends out from one to four scientific and practical collectors, and in addition employ a number of persons who permanently reside abroad to collect many of the local plants, bulbs or seeds from their respective residence. In the January number we have given a very complete list, and will add here a few more. J. N. Verschaffelt's letter from Ghent, Belgium, being delayed, and not reaching us until too late for the January number, we will give its new points here. He employs one collector in North Africa, three in Australia. two in Brazil, two at the Cape of Good Hope, two in Mexico, one in Natal, one in New Zealand, and two in South America.

J. Linden, Ghent, Belgium, employs one in Africa, one in Australia, two in Brazil, one at the Cape of Good Hope, two in Central America, and one in Mexico.

Otto Frœbel & Co., of Zurich, had only home (European) collectors in 1879. They were, namely, one in the Pyrenees, one in the Italian Alps, and one in the Eastern Alps.

Frederick von der Heiden, of Hilden, Germany, employs one collector in Mexico searching for new or rare Cactus, Echeverias and other succulents. He has a very extensive correspondence with lovers of this class of plants from all parts of the world, and is desirous to correspond with others interested in the same subject.

Henry Golding has moved further inland at the Cape of Good Hope, and still finds much of interest in that strange country.

Mr. C. F. Creswell writes from Melbourne, (Australia,): "I have one man collecting through the Colonies of Victoria, New South Wales and Queensland, who has collected in all 857 distinct varieties of Australian seeds and plants, now on exhibition at Sydney, N. S. W. The exhibit includes one variety unknown to botanical science, a specimen of which is now in the hands of Baron F. von Mueller, Government Botanist, of Victoria, for naming and classifying. The Baron will probably name this plant in honor of its discoverer, Mr. A. de la Camara, a gentleman of great botanical ability."

Among the Plant Collectors abroad, of which we should have made mention in the January number, was T. M. Hildebrandt, of Duesseldorf, now in Africa; Prof. H. Ohlburg, in Japan, (since deceased); Eduard Klabock and B. Handa, (Austrians,) in Mexico.

Additional Necrology of Botanists for 1879: In England, William Mudd, Botanic Gardens Cambridge, George Gordon, Cheswick. In Germany, Dr. Ph. Wilhelm Funke, Æ 88, at Halle, (Rheinish Prussia,) Comte Lambertye, Espernery. In Austria, Dr. Edward Fenzl, at Vienna.

THE botany of the Kuldja District (Northern and Central Asia) and the adjacent tracts to the north was studied by M. Regel, of St Petersburg, and rich collections of plants made, while the southern part of the same district and the confines of Chinese Turkestan were traversed by M. Fetissoff, the Director of the Botanical Garden at Vernoe. This gentleman demonstrated that the supposed volcanoes in the Kuldja District were really coal-beds in a state of combustion. His researches to the south, in the vicinity of Chinese territory, were checked by the hostility of a tribe called Champans, who fired on the party. Messrs. Middendorf and Smirnoff made a survey of the economic resources of the Ferganah Province; while Messrs. Mushketoff and Severtsoff conducted two separate explorations of the Pamir, which have left but little of these difficult highlands unmapped.—*Atheneum.*

RECENT PUBLICATIONS.

[We shall be pleased to receive from authors and publishers, copies of botanical books, papers, and prospectuses, for a notice in this column.]

AT last we are to have a work devoted to the Camellia, by the most successful cultivator in the United States, if not in the world. The *Practical Camellia Culture*, by Robert J. Halliday, Baltimore, Md., will be ready the first of May, 1880, price two dollars per copy, postage paid. In a private letter, Mr. Halliday says: "It will contain from 150 to 175 pages, in fifty chapters, exclusively on Camellias, with four colored plates and fifty wood engravings, giving all I know on their culture and propagation; how to grow all from cuttings: inarching and grafting, and all methods of growing the plants; what I claim to be new in dispensing with grafting and inarching; and growing *Alba Plena*, from cuttings, and all varieties. The only book of the kind; no copy or reprint, but practical experience of over twenty years. Of all the choice and beautiful Winter flowering plants, the Camellia and Azalea are to our fancy the most desirable, but they are also the most unsatisfactory ones to attempt to grow in the West, from the fact that we do not understand their wants. Now we feel encouraged to again try our hand at the culture of the Camellia, and profiting by Mr. Halliday's experience, shall expect to succeed. This announcement will also be good news to our friends in the Southern States, where the trees will stand in the open ground, from year to year, without any protection.

One of the most useful botanical works published in America recently, is C. E. Hobbs' *Botanical Handbook*, (Somerville, Mass.,) price $2.00, post paid. The work is complete in one volume of 271 pages; large 8 vo. arranged in three sections. Each section is arranged alphabetically, so as to form a complete index to the common, English, botanical and Pharmacopœial name of both plants and drugs. For every name or explanation given the author has authority unquestioned, and it is the result of no hasty compilation. The manuscript has received the attention of the compiler for *twelve years*, and during the whole of that time he has had still better preparation for the production of such a work, by being constantly in contact with, and handling most of the articles of the Pharmacopœia and the Botanical products used in domestic practice.

The first division of the work comprises a complete alphabetical list of common and local names by which botanical articles are known, referring to a second column, in which is the usual commercial English name of each common name: and a third column giving the botanical name of both, from the best recognized authorities. This division of the work comprises 135 pages, giving over 8,000 references. being a more complete list than has ever been published in any book of this kind.

The second division of the work comprises a complete list of Botanical names and synonyms, followed in the second column by their common names, and in the third column, in the case of the botanical names, giving the parts of plants and substances used, their properties and productions; and in case of synonyms, the name it is a synonym for. The exhaustive manner in which this part of the subject has been treated may be inferred from the fact that 88 names of Cinchona are mentioned; and the author has standard authority not only for the botanical names. but for the explanations given. In this part of the work are 85 pages, and over 5,000 botanical names.

In the third division of the work. precedence is given to the Pharmacopœial names, of which there are more than 2,700, alphabetically arranged, on 46 pages, with the authority—whether United States, British or German, Pharmacopœia is referred to. In this list the common names come second, and the botanical names in the third column. This list is most complete, containing as it does in the list of Balsamum, 29 names; Cortex, 159 names; Flores, 116 names; Folia, 90; Fructus, 51; Gummi, 66; Herba, 352; Oleum, 233; Radix, 325; and Semen, 141.

From the far-off antipodes comes the "*Organic Constituents of Plants*," by Wittstein, translated from the original German, and enlarged by numerous articles of original material by Baron Ferd. von Mueller. The work contains 332 pages, (8 mo., Melbourne, Australia,) 238 of which are devoted to a consideration of the organic constituents of over 800 plant and vegetable substances and their chemical analysis, while 98 pages are devoted to tables to render the subject still more complete. This work, together with the preceding one, are standard Medical Botanies, and as such will prove of great value to the profession, while their assistance to botanical investigators is difficult to compute.

The *Illustrated Gardeners' Lexicon*, (German,) published by Th. Rumpler, (General Secretary of the German Gardeners' Society) of Erfurt, Germany, is now in course of publication. It is issued in parts from the well known publishing house of Wiegardt, Hempel & Parey, Berlin, at one mark (twenty-four cents) each, and will be completed in thirty parts, containing, when complete, 1600 pages of closely printed matter, with 3,200 small but clear and distinct illustrations of plants, fruit, flowers, trees, shrubs, plans, models, portraits of prominent botanists, &c. The text will form a complete dictionary or encyclopedia to all botanical terms, a biography of all the prominent botanists both at home and abroad, also articles on horticulture, architecture, entomology, propagating, in fact every thing pertaining to botany; while a scientific description of each plant will be most complete.

From the same press Th. Rumpler issued, the first of the year, his *Seventh Annual Garden Kalendar*, (Almanac,) for the (leap) year, 1880, which is also a pocket manual of horticulture and botanical reference, designed especially for the gardener. It contains twenty-nine chapters or subjects, with a complete index, and is well bound in heavy card board, at two marks (forty-eight cents).

William Parry, of the celebrated Pomona Nursery, Cinnaminson, N. J., has just issued a small pamphlet of twenty pages, nearly twelve of which are devoted to the subject of the Chinese Pear and their Hybrids, which are without doubt the coming stock of Pears for America, giving his "forty years experience in Pear growing, and telling how to avoid the blight and insure good crops." It would be utterly useless for us to repeat that Mr. Parry is one of the most successful fruit growers in America, but as the INDEX is taken by many who have never given the subject any attention, perhaps the words may not be amiss.

The Fruit Growers' Friend, (R. H. Haines, Sangerties-on-Hudson, N. Y., 30 cents,) is an interesting fruit growers' manual or handy reference book of 38 octavo pages, devoted to practical experience and methods in growing all kinds of fruit, together with a description and history of each variety. The book also contains many choice lists of most desirable fruits for planting in different sections of the country, also direction for pruning, planting, preparing and shipping to market, and many other items of value to fruit growers.

From our horticultural friends in the Dominion of Canada we are again placed under obligations by the receipt of the *Annual Report of the Fruit Growers Association of the Province of Ontario*, 61 pages, and the *Annual Report of the Entomological Society of the Province of Ontario, 1879*, 89 pages, (the two Reports bound together.) The Reports are very acceptable and exceedingly interesting as they help form the only information obtainable of the Northern limits of cultivated table fruits. No one interested in the subject can fail to appreciate the great benefits sure to be derived from the experience and observations of such careful and intelligent workers as form the Fruit Growers Association of Ontario. The Entomological Report is second in importance to nothing we have had the pleasure of seeing in a long time, and with its excellent illustrations makes the fruit growers' insect friends and enemies familiar at once.

Twice each year we are favored with a copy of the semi-annual *Transactions of the Massachusetts Horticultural Society*, which contains not only the record of the Society meetings, but many carefully prepared papers upon all subjects pertaining to Horticulture. The society is one of the oldest in the country, if not the oldest, being incorporated in 1829, and contains among their active members some of the very best Horticulturists of Massachusetts. These year books form an almost indispensable book of reference to a Horticultural library, and are very much prized both in Europe and America, for which reason they are exceedingly difficult to obtain.

Dr. R. Schomburgh, Government botanist of South Australia, sends us his "*Annual Report on the Progress and Condition of the Botanic Garden and Government Plantations, (1879)*." This is a work of great value to botanists in all parts of the world, as he devotes ten pages principally to a report of his experimental grounds; five pages, with a large plate, to the Grape pest, *Phylloxera Vastatrix*; and six pages to an enumeration of plants added to the gardens during the year. England has been extremely fortunate in securing so valuable a botanist to develop a portion of her vast domain.

Our list of *Recent Publications* would be incomplete without a notice of the publications of our new plant merchants, which are annually issued under the name of *New Plant Catalogues*. These publications are the annual records of a year's collecting, usually in little known parts of the world: and, as a rule, it would be a long time before the civilized world would know of their existence, except through the efforts of commercial botanists. Among the number especially valuable, is: Aug. Van Geert, Jean Nuytens Verschaffelt, Louis de Smet, Louis Van Houtte, Jean Linden, and our special friend and correspondent, J. Vander Swaelmen, all of Ghent, Belgium; B. S. Williams, Thomas S. Ware, E. G. Henderson & Son. James Veitch & Son, William Bull and many others, of London, England; Harry Cannell, of Swanley, England; Vilmorin, Andrieux & Co., of Paris, France: P. & E. Transon, Orleans, France; F. von der Heiden, Hilden, Germany; J. J. Van Loghem, M. C. Alkemade & Son, E. H. Krelage & Son, also our special friend and Holland correspondent, C. E. Van Goor, all of Haarlem, Holland; A. M. C. Jongkindt-Coninck, of Dedemsvaart, Holland; Fræbel & Co., Neumunster-Zurich, Switzerland: and a host of other equally as active merchants. These publications are not only a recognized authority, and give a correct description of the plants, but, also, usually a history of their native countries and notes on their original condition of growth and uses.

HORTICULTURAL SOCIETIES.

KENTUCKY HORTICULTURAL SOCIETY.

THE Society met in Layson Hall, Shelbyville, Ky., January 13, 1880, for a three days' session, President Kennedy in the chair. Delegates from other State Societies were introduced and welcomed. Letters were read from Dr. Warder and Dr. Morton. The Secretary, Treasurer and Committees presented their reports, after which several important Committees were appointed; one, at least, of which should have been appointed in every State, viz., "a committee to secure Legislative assistance to require State assessors to obtain full statistical returns of the acreage and product of the fruit crop each year. Many valuable papers on fruit and fruit growing were read, and the following discussion must prove beneficial to all horticulturists. The following officers were elected for 1880: T. S. Kennedy, Louisville, President; H. B. Todd, Eminence, Vice President: J. S. Beatty, Simpsonville, Treasurer; J. Decker, Fern Creek, Recording Secretary; J. B. Nall, Louisville, Corresponding Secretary. The committee on fruits is comprised of one person from each county in the State. Shelbyville was selected as the next place for meeting. (1881,) and Louisville was chosen as the place for the Annual Strawberry Exhibition in May. The State Commissioner of Agriculture, Horticulture and Statistics, offered to publish the Society proceedings in his annual report, which was accepted, after which the Society adjourned *sine die.*

NORTHERN ILLINOIS HORTICULTURAL SOCIETY.

THE Thirteenth Annual Meeting of the Northern Illinois Horticultural Society was held on the 27th, 28th and 29th of January, 1880, in the city of Elgin, Illinois, with a larger attendance and an increased interest in the proceedings. The President, Jonathan Periam, of Chicago, opened the session, and to expedite business the first day was devoted to the President's address, the reading of the Reports and other important Society business, after which the Society devoted their entire time and energy to a discussion of fruit, its culture, value and enemies. Among the prominent working members present was Prof. Cyrus Thomas, A. Bryant, A. R. Whitney, and D. W. Scott.

The second day was devoted to a consideration of Insects, The Vineyard, The Greenhouse, Vegetable Gardening, etc. The third day opened with Plums for a subject, which brought out many valuable facts and suggestions regarding this most delicious fruit.

Mr. D. C. Scofield, of Elgin, opened the subject of Forestry by a very interesting paper. O. B. Galusha read a letter from Dr. Warder on the same subject, which was followed by several carefully prepared papers on Forestry by some of the best Foresters of Illinois—of which she has a surplus—all of which provoked a very instructive discussion. According to Mr. Scofield's paper there has been 80,000,000 trees planted in Illinois in the past eight years, under the influence of the society. The discussion elicited the fact that the most satisfactory timber trees to plant in Illinois, are the White Pine, Scotch Pine, European Larch, Norway Spruce, White and Red Cedar, Hemlock, Western Catalpa, Sugar and Soft Maple, American White Oak, European Crab and Black Walnut. Large Evergreens should be transplanted in early Spring, say April, but small ones might be transplanted as late as June.

Dr. W. A. Pratt, of Elgin, was elected President for 1880. D. W. Scott, of Galena, Corresponding Secretary. O. B. Galusha, of Morris, Recording Secretary; and L. Woodard, of Marengo, Treasurer.

The Society adjourned at the close of the third day, to meet at Franklin Grove, the second Thursday in January, 1881.

THE MINNESOTA STATE HORTICULTURAL SOCIETY.

THE Minnesota State Horticultural Society held their fourteenth annual meeting in the rooms of the Board of Trade, at Minneapolis, Minn., January 21, 22 and 23, 1880. Nearly all the prominent Horticulturists of the State were present and delegates from many adjoining State Associations. A magnificent display of Fruit and Flowers from all parts of the State were on exhibition in the City Council Chamber. The President, J. T. Grim, opened the session, which for three days was devoted to the interesting experience and observation of practical workers, together with the valuable discussion which did much to disseminate a knowledge of which fruits are best adapted to the climate and soils of Minnesota. It was the generally accepted verdict that a Northern aspect was most desirable for all kinds of fruit. The Committee on the Russian Apples requested more time to study their adaptation to Minnesota. This is by far the most important Committee, and as they have not reported for two years, no definite good has yet been accomplished by them.

J. F. Grimes, of Minneapolis, was re-elected President, N. S. Hollister, of St. Paul, Secretary, and A. W. Sias, of Rochester, Treasurer, for the ensuing year. J. T. Grim, E. D. S. Dart, of Owatonna, J. M. Underwood, Lake City, A. W. Sias and A. W. Latham, of Excelsior, were elected Committee on Russian Apple; D. Day, of Farmington, F. Gould, of Excelsior, G. W. Fuller, of Litchfield, M. Pierce, of Rochester, and J. S. Harris, of La Cressant, were elected Committee on Seedling Apples. These are by far the most important of all the Committees, and we shall await their report with a great deal of impatience. The society adjourned to meet at same place on the third Tuesday of January, 1881.

OHIO FORESTRY ASSOCIATION.

THE annual meeting of the Ohio Forestry Association was held in Columbus, Ohio, January 7th, but as we have not been favored with a report of the proceedings, we can not say much for it. We have, however, been favored with the President's (Dr. Warder) address, which is one of the most useful papers for the tree planters of Ohio we have seen in a long time. Dr. Warder strongly endorses the following for planting: Catalpa speciosa, Black Locust, Alianthus and Scotch Pine for timber.

MINNESOTA STATE FORESTRY ASSOCIATION.

THE Association met in the Governor's rooms at the Capitol, St. Paul, January 13th, 1880, Hon. G. S. Becker presiding. The report of the Treasurer shows the society to be in a flourishing condition financially. The meeting was well attended by representatives from all parts of the State. The discussions developed the fact that the Cottonwood, *Populus monilifera*, was considered the most desirable tree for planting, while the box-elder, *Negundo aceroides*, stands second; also that White Pine, *Pinus Strobus*, was considered the best for planting as a wind break, and that young trees should be set nine feet apart each way for distance. The officers for the ensuing year are G. L. Becker, of St. Paul, President; and L. B. Hodges, St. Paul, Secretary.

NOTICE OF THE THIRTEENTH ANNUAL EXHIBITION OF HYACINTHS AND OTHER FLOWERROOTS, HELD BY THE SOCIETY FOR CULTIVATION OF FLOWERROOTS, AT HAARLEM, HOLLAND, FROM MARCH 19th TO 23d, 1880.

To-day at one o'clock the exhibition of Hyacinths and Flowerroots was opened with an excellent address by Mr. E. H. Krelage, President of the Society for the Cultivation of Flowerroots, wherein he congratulated the members of the Society with the flourishing state of their trade, and expressed the good wish that this state, notwithstanding the many difficulties by which it is opposed, might always increase.

As might be expected, the Hyacinths took the lead at this exhibition, and I am sorry to say that it was plainly to be seen that this class of Bulbs had suffered a great deal the last year; still there were many beauties, of which I will give you a short list, which may perhaps be of interest to amateurs. The very best double red Hyacinths were: *Lord Wellington*, *Leo XIII*, *Le Grand Concurent*, *Louis Napoleon*, *Koh-i-noor*, *George Peabody*, *Prince of Orange*, *Princesse Louisa*, *Rosa de vries* and *The First*. Among the double blue ones: *Garrick*, *Laurens Koster*, *Prince of Saxony Weimar* and

Van Speijk, and among the double whites: *Grand Vainqueur*, *Jenny Lind*, *La Mignonne*. *La Tour d'Auvergne*, and last, but not least, *Miss Nightingale*.

Among the single Hyacinths there were many more sorts to be remembered, so that I shall only give the very best single red and rose: *Cavaignac*, *Garibaldi*, *Howard*, *Leviathan*, *L'Incomparable*, *Linnaeus*, *Fabiola*, *Lord Macaulay*, *Reizerin Augusta*, *Milton*, *Princesse Amalia*, *Pelissier*, *Rubra maxima*, *Queen Victoria*, *Scarlet light* and *Vuurbaak*. Single blue: *Argus*, *Czar Peter*, *Charles Dickens*. *De Candolle*, *Grand Lilas*, *Grand Maitre*, *Lord Derby*, *Lord Palmerston*, *King of the Blues*, *Marie*, *Masterpiece*, *Manteufel*. *Mary of Cambridge*, *Osmar* and *Starlight*. Single white: *Alba superba*, *British Queen*, an excellent variety, *La grandesse*, *L'innocence*. *Mont Blanc*. *Nectar* and *Snowball*. Single violet: *Arnold Prince*, *Charles Dickens*, *Haydn*, *Florence Marryat*, *Marquis of Hartingdon* and *President Lincoln*. Single yellow: *Ida*, *King of Yellows*, *Lord of Magdala*, *John Stuart Mill and Obelisque*. A great many pans filled up with 10 Hyacinths of one sort were to be seen: one bed of such pans surrounded with *Spirea japonica*, made a splendid sight, and were one of the attractions of the exhibition. The most recommendable sorts, being short in the foliage and flowers were, single red: *Josephine*, *Queen Victoria*, *Pelissier* and *Von Schiller*. Single white: *La Franchise*, *Nectar*, *Madame van der Hoop*, *L'Innocence* and *Madame de Stael*. Single blue: *Clio*, *La Nuit*, *Lord Palmerston*, *Lord Derby*, *Grand Lilas* and *Nimrod*. Before taking leave of the Hyacinths I must speak of the new sorts, which were exhibited for the firse time (conquest.) The first prize was awarded to the Hyacinth *Miss Le Jeune*, a single variety, of a deep violet color, with splendid large white eye and fine truss. The second prize was to the Hyacinth *Financier*, a single light pearl blue variety, with immense spikes, in the way of *Czar Peter*. The third prize was to the Hyacinth *Roi des Belges*, a single, deep carmine variety, with large spikes. For the new double Hyacinth there was only one sort sent in, to which a prize was awarded, namely, *Empress of India*, a semi-double deep carmine-red variety, with a well formed spike.

The exhibits of single, early Tulips were not many, but made, by their striking colors, a good effect. The very best sorts were: *Comte de Vergennes*, *Brutus rectified*, *Chrysolora*, *Cottage Maid*, *Fabiola*, *Le Matelas*, *Little Doris*, *Pottebakker*, white, and ditto yellow, *Proserpine*, *Rembrandt*, *Roi Pepin*, *Superintendent*, *Standard Royal*, *Van Vondel* and *Vermillion brilliant*. In order to show the utility of Tulips for bedding, there was a moist bed of them made up with small plants of *Spirea Japonica*, an Amaryllis in the centre, and surrounded by Cyclamens, which were very beautiful indeed, and generally conceded to be the finest attraction of the show.

Of single late Tulips there were two exhibits, but not worthy of mention. Of double Tulips, Polyanthus and Narcissus, no exhibits. Of Crocus there were two exhibits, the best sorts were: *Albion*, striped, *Sir Walter Scott*, striped. *Mont Blanc*, white, *Caroline Chisholm*, white, *Baron von Brunow*, purple, and *Koh-i-noor*, purple. Of *Amaryllis Hippeastrum*, there were three excellent exhibits, and the most striking varieties were: *Louis van Houtte*, *Miss Nilson*, *Chef d'renore*, *Oscar*, *Prince of Wales*. *L'Avenir*, *La Volupte*, *Remembrance* and *Friede*, a nearly pure white variety. Still must be mentioned, two pots of Lilies: *L. Thunbergianum elegans, and L. Umbellatum Daruricum*, which showed beautiful orange flowers, also different exhibits of *Spirea Japonica*, *Dyclytra spectabilis*, single and double Narcissus, Rhodendrons, Bouquets, Tools, etc.

Before ending I must say a word in praise of Mr. E. H. Krelage, the President. who not being a competitor for the prizes, kindly sent a beautiful collections of bulbs, novelties, and different other plants. too many to be enumerated, so that he enabled the Committee of Arrangements (which had done its best. and also deserved a word of praise,) to arrange one of the best shows of Flowerroots which was ever held at Haarlem.

C. E. VAN GOOR.

THE GERMAN TRADES EXPOSITION.

THE Annual German Trades Exposition of Rheinland, Westfalen and surrounding country will be held at Dusseldorf, Germany, commencing May 9th, and ending September 15th, 1880. The exhibits will embrace Plants, Fruits, Plans, Models, Architecture, Garden Statuary, Art Collections, etc. Only such Plants can be admitted as have been raised by the exhibitor or those which have been six months in course of cultivation. The meeting of the German Gardener's Society will also be held at the same place, during the Exposition, and will be in session from the 7th to the 17th of August, 1880. There will also be four other brief exhibitions held at the rooms of the Trades Exposition during the season, one commencing May 9th and holding until the 19th; the second, from the 19th to the 27th of June: the third, from the 7th to the 17th of August, and the last of the series, will commence September 4th and continue until the close of the Exposition, September 15th. As there has been no Exposition for several years, this will no doubt be a grand affair.

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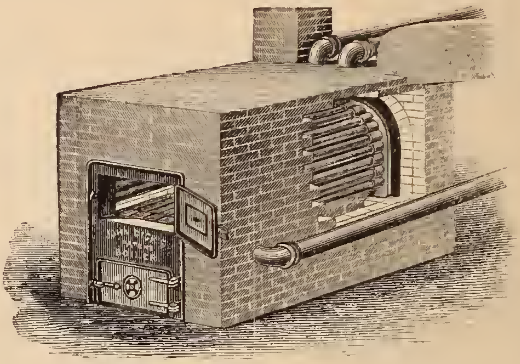

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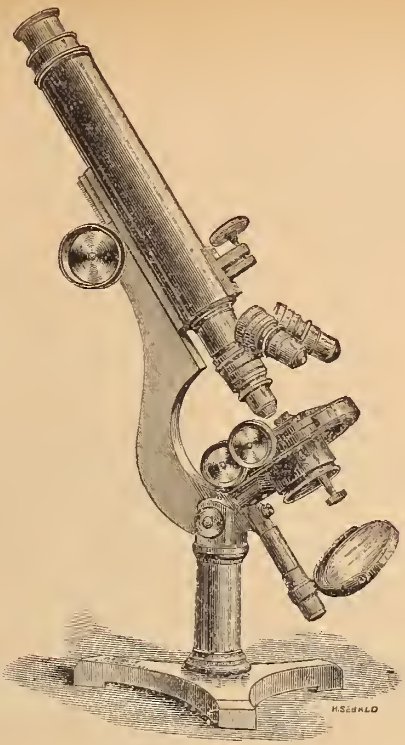

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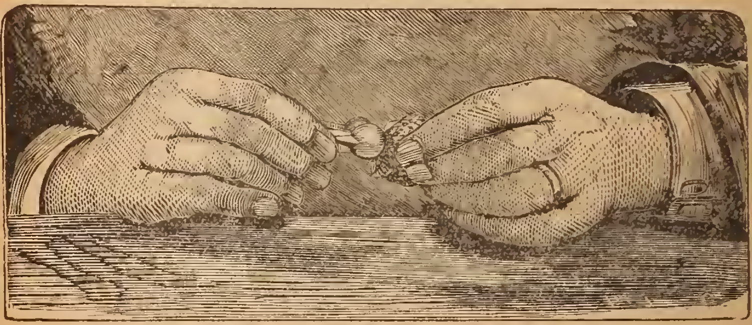

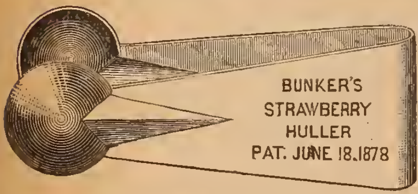

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L. B. CASE'S
BOTANICAL INDEX

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AN

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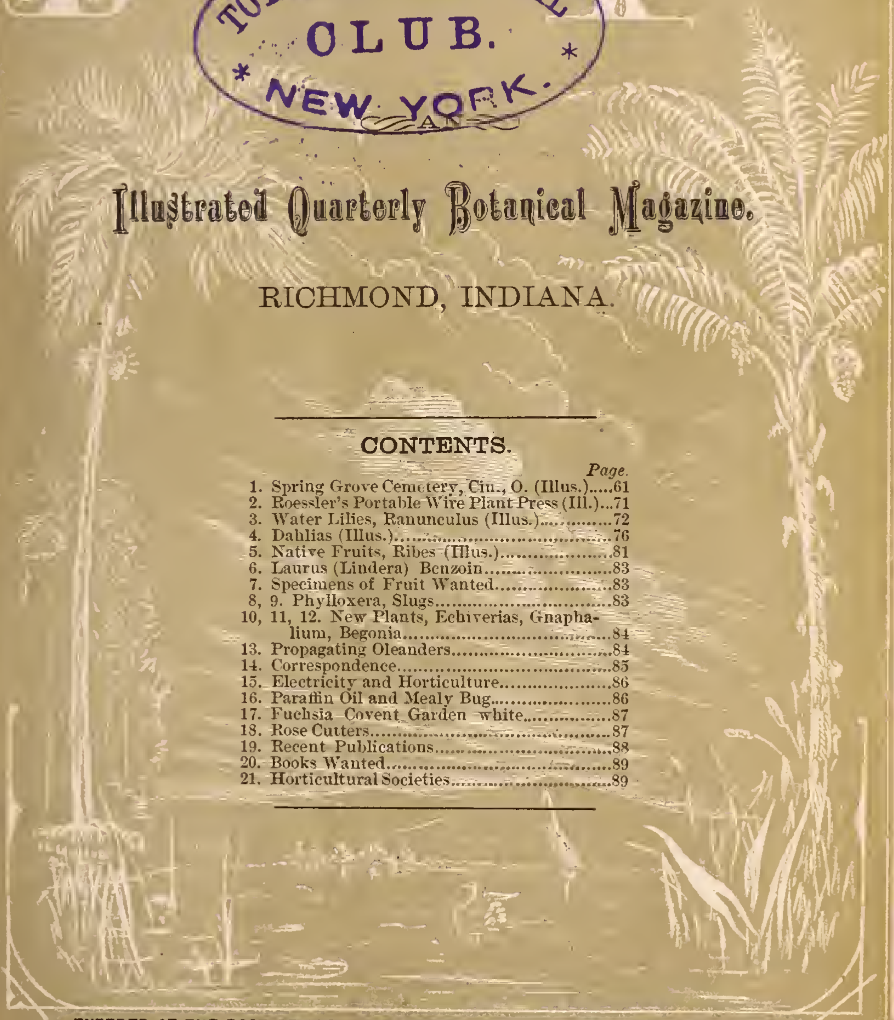

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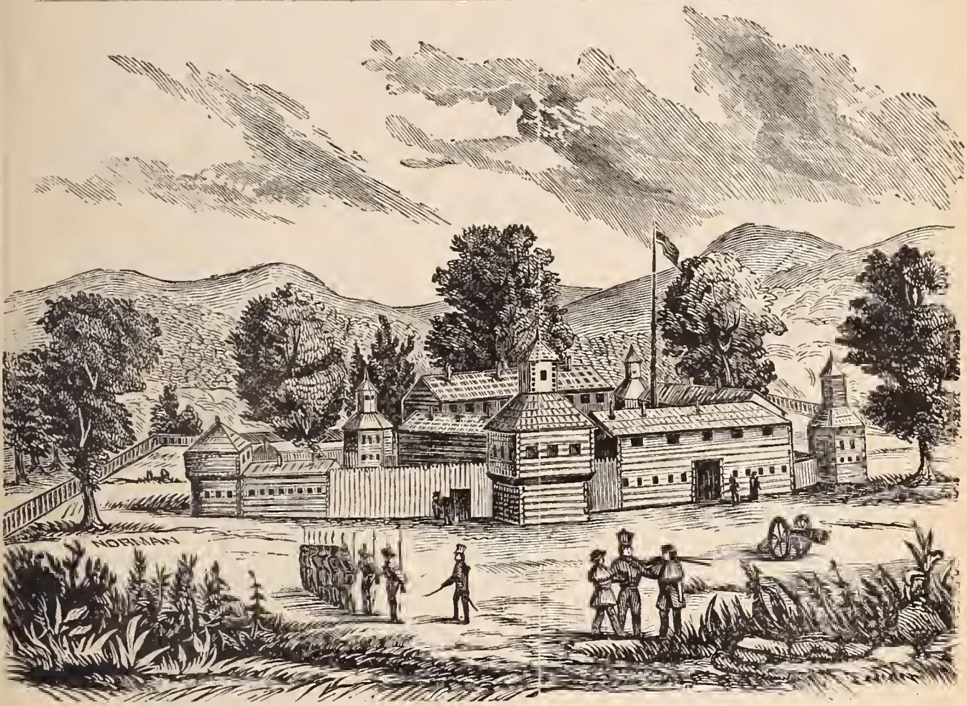

FIG. 191. *Fort Washington (Cincinnati) in 1790.*

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But our special object in this article is to talk of the beauties and charms of that wonderful City of the Dead, adjoining Cincinnati,—SPRING GROVE CEMETERY. Still, as this place is entirely the result of the proximity of a large and wealthy city, and its future improvements depends largely upon the prosperity of the city, we will devote a small portion of this article to a brief historical description of Cincinnati, as gathered from the popularly accepted histories, together with the causes that led to the settlement.

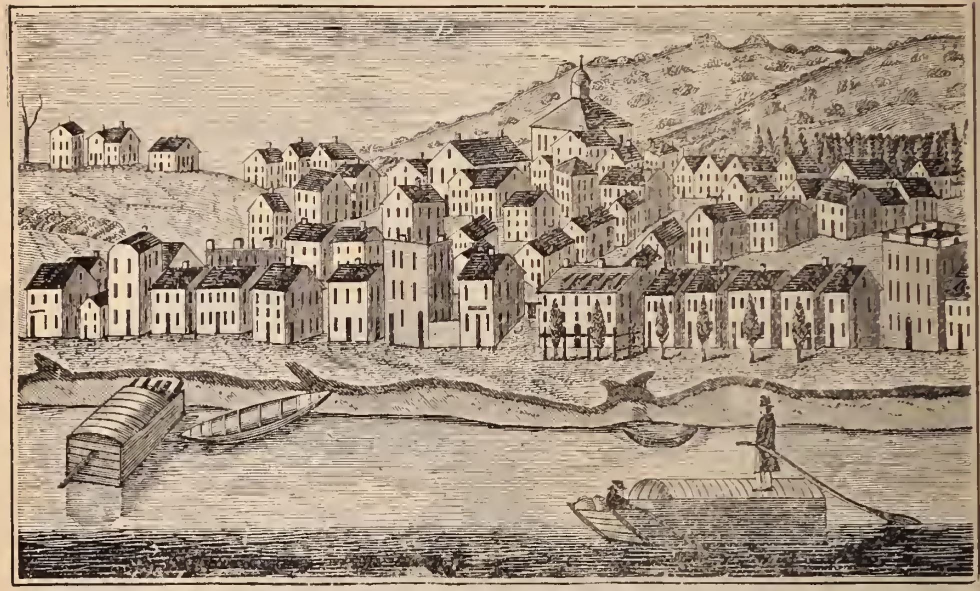


FIG. 192. *Cincinnati in* 1810.

Although the close of the war for American Independence found the country completely exhausted, financially, it also found the colonies engaged in an unnatural and uncalled for strife for possession of the unsettled, and as yet almost unknown, public domain west of the Alleghany mountains. But not only was each colonial government striving (perhaps *conspiring* would be a better word,) to obtain possession of as large a share of the new territory as possible, but, also, in each colony, and in almost every city there were organized companies to obtain possession of some of the unoccupied new land, which was reported to be of such marvelous fertility. A large portion of these anxious emigrants had served in the Revolutionary army with merit and distinction, but for their seven or eight years of service and privations had received no moneyed compensation of any real value, and in addition, a large number had lost by the war all they formerly possessed, so that they must of necessity commence anew the battle for life and subsistence. These men claimed, and it must be acknowledged with seeming justice, that by rights this unoccupied land should be the common property of those who had given their services and risked their lives to obtain a national freedom, and accordingly made many attempts to obtain possession. It was during these dark and gloomy times that John Cleve Symmes, the then Chief Justice of New Jersey, purchased for himself and associates from the General Government 2,000,000 acres of land on the north bank of the Ohio river, from the Big Miami to the Little Miami rivers, *in the Ohio country*, for 66⅔ cents per acre, payable principally in the then almost worthless Continental scrip, (paper money issued by the Continental Congress). Judge Symmes' first proposition was dated August 29, 1787, but so anxious was he to survey and settle it up, that he started west before the sale was consummated, which created a strong suspicion of an intention of obtaining forcible possession of a portion of the country. Orders were accordingly issued by the Government to the military commander at Pittsburgh to dispossess him, which, however, only had the effect of delaying the settlement one or two years. In 1788 Judge Symmes reached Marietta, the only settlement on the Ohio River between Pittsburgh and Louisville, and there sold to Major Ben Stites and 18 or 20 associates, also

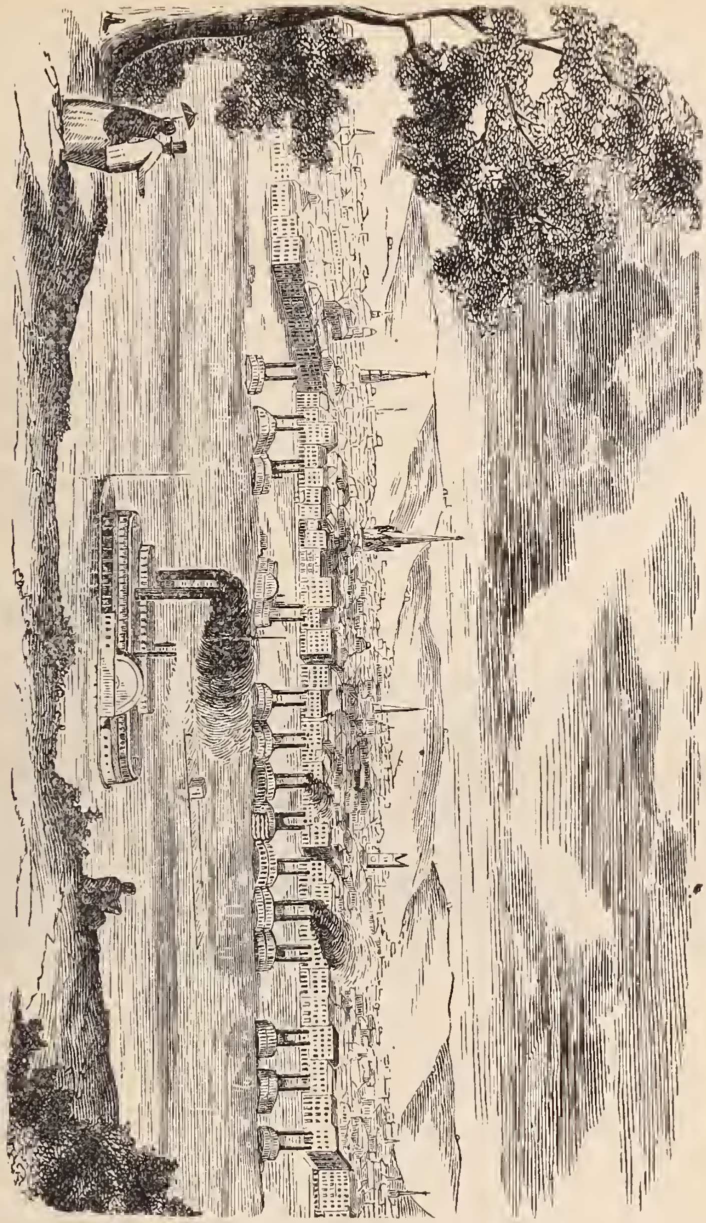


FIG. 198. *Cincinnati in 1845.*

[It may assist the reader in forming an idea of the remoteness of Cincinnati from civilization, as well as the difficulties of a journey in the *new West* in early times, to mention the fact as given in Judge Burnet's letters that the average time required to make a trip from Cincinnati to New Orleans and back was six months, and that the first regular line of boats between Cincinnati and Pittsburgh was established in 1794, and comprised two perogue or keel boats, which required eight weeks to make the round trip, so that one boat left Cincinnati once in four weeks. The only kinds of water crafts on the Ohio river were the perogue or keel boats, flat boats and canoes, and were propelled by ores or setting poles. These crafts, often known as *arks*, *Kentucky boats*, etc., were necessarily small, and the cargoes proportionately light, but were still in use until the introduction of steam, in 1817, and still the flat boat is very extensively used on all the Western rivers for transporting bulky merchandise.]

from New Jersey, 10,000 acres of land at the mouth of the Little Miami river, which they called Columbia. They arrived at their new purchase in November, 1788, and as the locality is now within the corporate limits of Cincinnati, we must date the first settlement to 1788. At the same time and place (Marietta, 1788,) Judge Symmes sold to Matthias Denman and associates 10,000 acres of land directly opposite the mouth of Licking river, Kentucky, and which was the oldest portion of Cincinnati until Columbia was annexed to it. A small portion of the colony arrived at their newly purchased territory, which they named Losanteville, late in December, 1788, but no settlement was made until the following year, during which time, at the earnest request of Governor St. Clair, Judge Symmes and others, this unmusical name was exchanged for the more classical one of Cincinnati. Judge Symmes selected for his home the western portion of his purchase, at the mouth of the Big Miami river, 15 miles below the present city of Cincinnati, and called his settlement North Bend. Here he expected to build a large city—possibly, the future emporium of the West, but fortune ruled otherwise. In 1790 the General Government built Ft. Washington, Fig. 191, for the better protection of the settlers, which being located at Cincinnati, without doubt influenced the early growth and prosperity of that city.

Cincinnati is built on the north half of a natural plateau nearly twelve miles in circumference, with an average width of about three miles, comprising an area of nearly 24 square miles, and surrounded by a circular horizon of wooded hills 300 feet high. Latitude, 39° 6′ 30″ north; longitude, 84° 26′ west; altitude, 498 feet above the level of the sea. Through this natural amphitheater the Ohio river, entering from the east and winding around for about 10 miles, from and including Columbia on the east, to Riverside on the south-west, with an average width of about 600 yards, separates Cincinnati proper from the suburban cities and villages of Covington, Newport, Ludlow, Dayton and Bellevue in Kentucky, but which are properly a portion of Cincinnati, as the majority of the residents depend upon Cincinnati for their living or are doing business in the city, while from choice they reside in a suburban town or in their country residence. Of course State boundaries will preclude a possibility of these detached parts ever being consolidated into one grand whole, but it may be well enough to finish our sketch of it all as a portion of one settlement. Licking river subdivides the southern half of the plateau into equal parts and forms the divide between Covington and Newport. Both plateaus present two terraces or river benches, the first (lowest) one being only 50 feet above the river, while the upper one is 58 feet still higher. Originally, Cincinnati was built on the lower terrace, while directly back of the village stood Ft. Washington on the second terrace, between what is now Third and Fourth street, and east of Eastern Row (now Broadway). The city did not extend to the summit of the hills to any considerable extent until within the past few years, or until the new Incline Plane Railroads had made their location more easy of access, consequently more desirable. Now, however, some of the finest resident and suburban property lies upon the summit of the highest hills which command such a magnificent view of the city, river and adjoining country.

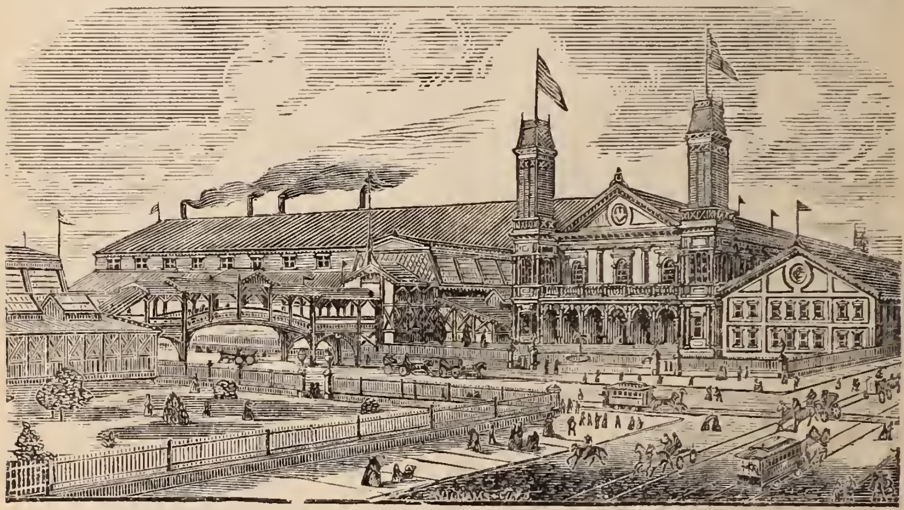


FIG. 194. *First Cincinnati Industrial Exposition Building*, 1870.

Fig. 191 is engraved from an old painting of Ft. Washington, long since removed, and gives a correct view of the old fort as remembered by some of the old residents. The engraving was made by M. & R. Burgheim for their valuable Guide to Cincinnati, and through whose courtesy we are enabled to illustrate this article. It was composed of a number of strongly built hewed log cabins, a story and a half high, calculated for soldiers' barracks, and so placed as to form a hollow square of about one acre of ground, with a strong block-house at each angle, built of large logs, cut from the ground, which was a military reservation of 15 acres (reserved by Congress in the organic law of 1792) for the accommodation of the garrison.

Cincinnati enjoys the undivided honor of being the first American city to institute an annual Industrial Exposition for the exhibition of arts and industries, which are now so popular and enjoyable as well as so beneficial to the country at large. The first building, Fig. 194, was orginally erected for a National Sængerfest, in 1870, and covered 3½ acres of ground, but by a judicious building of galleries the exhibition space was increased to fully 7 acres. This building was such a temporary affair that after 5 years' of service it was declared unsafe and taken down, but the necessity of a suitable place for continuing the Exposition was soon felt, and the present handsome structure, Fig. 195, was built in 1879, mainly through the munificence of Reuben R. Springer, one of Cincinnati's merchant princes. The entire building, including the Exposition buildings proper and the Music Halls, occupies nearly an entire square, (316 by 402 feet square,) and is so arranged that each portion can be used separately or by connecting together the different portions with bridges, artistically arranged, the whole building may then be thrown into one. Not only does Cincinnati claim the honor of inaugurating the first annual Exposition, but also enjoys the proud distinction of outranking all other institutions of a similar nature in point of excellence. First, their premiums exceed any other of the kind. Second, the judges and juries for deciding the merits of all exhibits are carefully selected from among the most experienced and practical men and women in the country. We cannot dismiss this part of the subject without adding that the next or EIGHTH CINCINNATI INDUSTRIAL EXPOSITION will open on Wednesday, the 8th of September, and continue until Saturday, the 9th of October, 1880. The high character of all the preceding Expositions is well known, and we are assured that in no respect will any department of that of 1880 be inferior to those of past years, but the aim will be to excel all others.

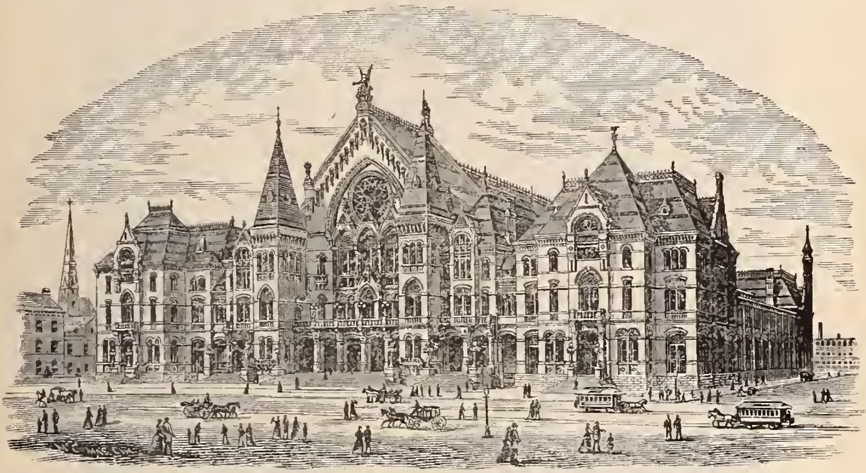


FIG. 195. *Cincinnati Industrial Exposition and Music Hall Building.*

One of the most important gifts to the people of Cincinnati is the Tyler Davidson Fountain, Fig. 196, which was donated to the city by Henry Probasco, Esq., in memory of his brother-in-law, Tyler Davidson. The fountain is cast in bronze of condemned cannons, procured from the Danish Government, and weighs 24 tons. Its height is 38 feet and is ornamented with numerous appropriate bronze ornaments, and was cast in Munich, Bavaria, by Ferdinand von Mueller, at a cost of $105,000, (gold). It was designed by Aug. von Kreling, Neuremburg, Germany, and is one of the finest works of art of the kind in America. The basin is of dark porphyry, 43 feet in diameter, and finished in Europe before shipping to America. It stands on Fifth street, and was unveiled October 6, 1871.

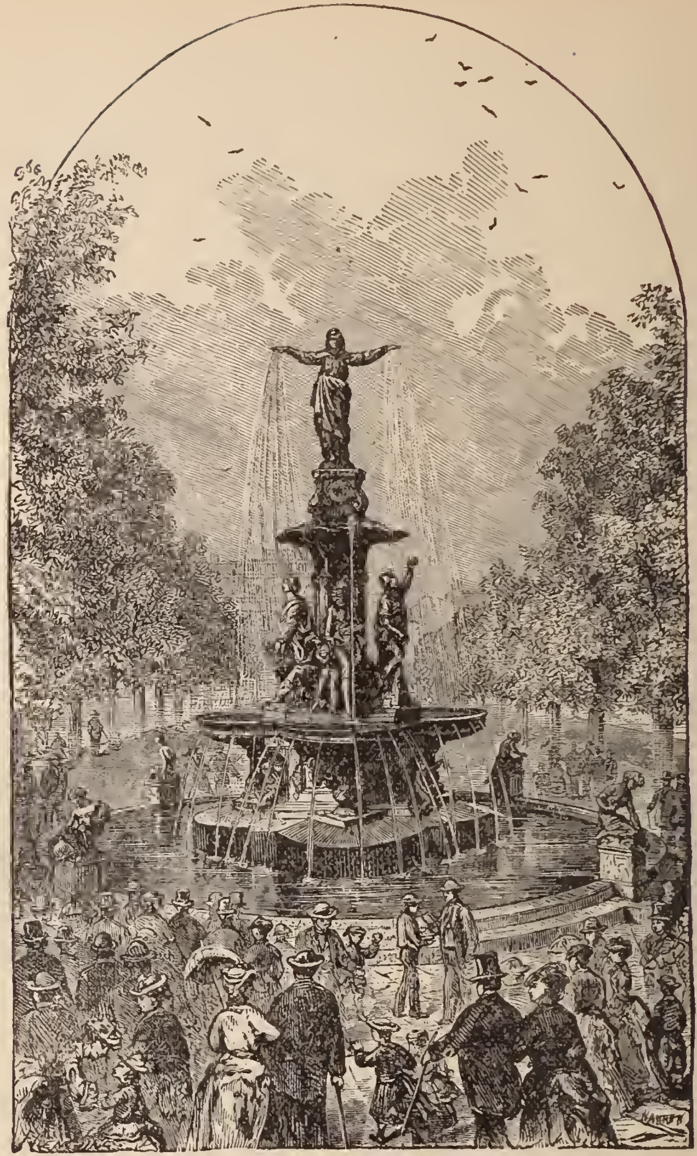


FIG. 196. *Tyler Davidson Fountain.*

But space will not permit of a further digression from our proper subject, which we close by giving the growth of Cincinnati, for nearly a century past, as gathered from the U. S. census:

In 1800	750	In 1850	115,436
In 1810	2,540	In 1860	161,044
In 1820	9,602	In 1870	216,239
In 1830	24,831	In 1875 about	250,000
In 1840	46,338	In 1880, estimated	300,000

Add for 1875: For Covington, 36,000; Newport, 16,000; Dayton, 1,000; Ludlow, 1,500; Bellevue, 1,500, which will make over 300,000 for Cincinnati and its suburbs for 1875. As the census of 1880 is not yet completed, we can only give the estimate, which for Cincinnati and all its suburbs will reach nearly 400,000.

As we have already stated our object in this paper to be a visit to a place of more than ordinary interest, we will ask our readers to take a *stroll* with us—in fancy, on a bright May morning, to the model cemetery of America—SPRING GROVE, for in no month of the year is nature more beautiful, at least in our latitude, than in the month of May. Now, all nature seems refreshed and bursting into new life after the long, cold and dreary months of winter, which, however, is only a season of rest and sleep for the whole vegetable kingdom. We are supposed to be comfortably located in Cincinnati, and will leave the city with its smoke, dust and busy life for the quiet solitudes of nature. The trip will not be a new one to us, but it always adds fresh charms upon each repetition, and, especially if we are strangers, many strange sight will greet our eyes. We will choose Spring Grove Avenue for our route, as it is such a popular drive and affords so many fine views of suburban residences of great beauty. This drive, a few years ago, was the favorite resort for horse racing and fast driving, but the cemetery association have now stopped it by an act of the State legislature. The avenue is 100 feet wide, with a well kept and finely finished roadway, and from the city limits to the entrance at the cemetery, about 3 miles, is shaded, with a row on each side, of majestic silver leaf poplars, about 35 years old and measuring about two and a half feet in diameter, with broad and spreading branches, making an almost complete canopy. Unlike the popular routes and drives of many of our large cities, this avenue is not ruined with street railroad tracks along the centre of the road bed, but the whole space is reserved for the undivided use of the entire community, while along the sides of the road, or between the trees and fences, are the street railroad tracks on each side.

Arriving at the main entrance of the cemetery, which is on Spring Grove Avenue, we find a large stone structure of the Norman-Gothic style of architecture, one hundred and thirty feet long, including gateway, erected at a cost of over $50,000, containing a large reception or waiting room for visitors, and several apartments for the use of Directors, Superintendents, etc.

Anticipating the future wants of a great and wealthy city, Chief Justice S. P. Chase and a few associates, in 1844, selected the old Gerrard farm on Mill Creek, directly north of Cincinnati, and organized the Spring Grove Cemetery Association, obtaining a charter under the State laws of Ohio the following year. The location is a charming one for the purpose, being one of the most picturesque around Cincinnati, easy of access by railroad, street car lines or carriage drive; but most important of all is the fact that the high bluffs on all sides break the force of the cold and destructive winds at all seasons of the year. The original purchase was 166 acres, but to this has been constantly added as opportunity offered, until now there are 600 acres enclosed, and a large portion already improved. Through the grounds are now 10 miles of solid paved and graveled drives, while nearly 8,000 lot holders have contributed to its improvements. At the present date there have been nearly 37,000 interments, but as a large portion of the residents are still attached to some one of the numerous older established cemeteries around Cincinnati, which still are in partial use, the interments are not as numerous as one would expect for such a desirable place.

The orignal designs were furnished by Mr. John Notman, of Philadelphia, and pertain to the style of landscape architecture of the past generations. Here we find the plats of ground laid out in small pieces, with a corresponding superabundance of roadways, while the newer additions have larger plats of ground, with longer and straighter drives occupying much less ground. Of course straight lines are always ignored, but long and graceful curves bring one gradually to new views, new lakes, or new ideas being carefully carried out.

Of course our first duty will be to call upon the Superintendent of the place, who lives in a plain two-story brick house, back of the centre of the ground. Here we found Adolph Strauch, the present Superintendent, a hale and hearty Prussian, with his wife, an American lady, and their two small children, a son and daughter, all as cheerful as though there was no cemetery within 100 miles of them. With a hearty welcome we are bid to enter, and while we talk of the beauties of the place, we are also reveling for a short time in the feast of rare and costly landscape literature, in such abundance about the room. We cannot give a list of all these rare works of art but noticed there huge monographs of the *Genus Pinus*, *Quercus*, (Oaks,) &c., a rare work by Prince Puckler Muskaw, on Remarks on Landscape Gardening, with drawings by W. G. Schermer, of Dusseldorf, large Wall Maps and plans of the most celebrated parks and cemeteries in the world, including Regent Park, London, Luxemburg Park, France, &c., all from his (Strauch's) own hand. But space will not permit of even a hurried description of the gems and wonders of these rooms.

In 1854 Mr. Strauch took charge of the grounds, and although he has made very few changes in the old improved portions of the place, he has changed the whole aspect of the place since his superintendency by blending as far as possible the old

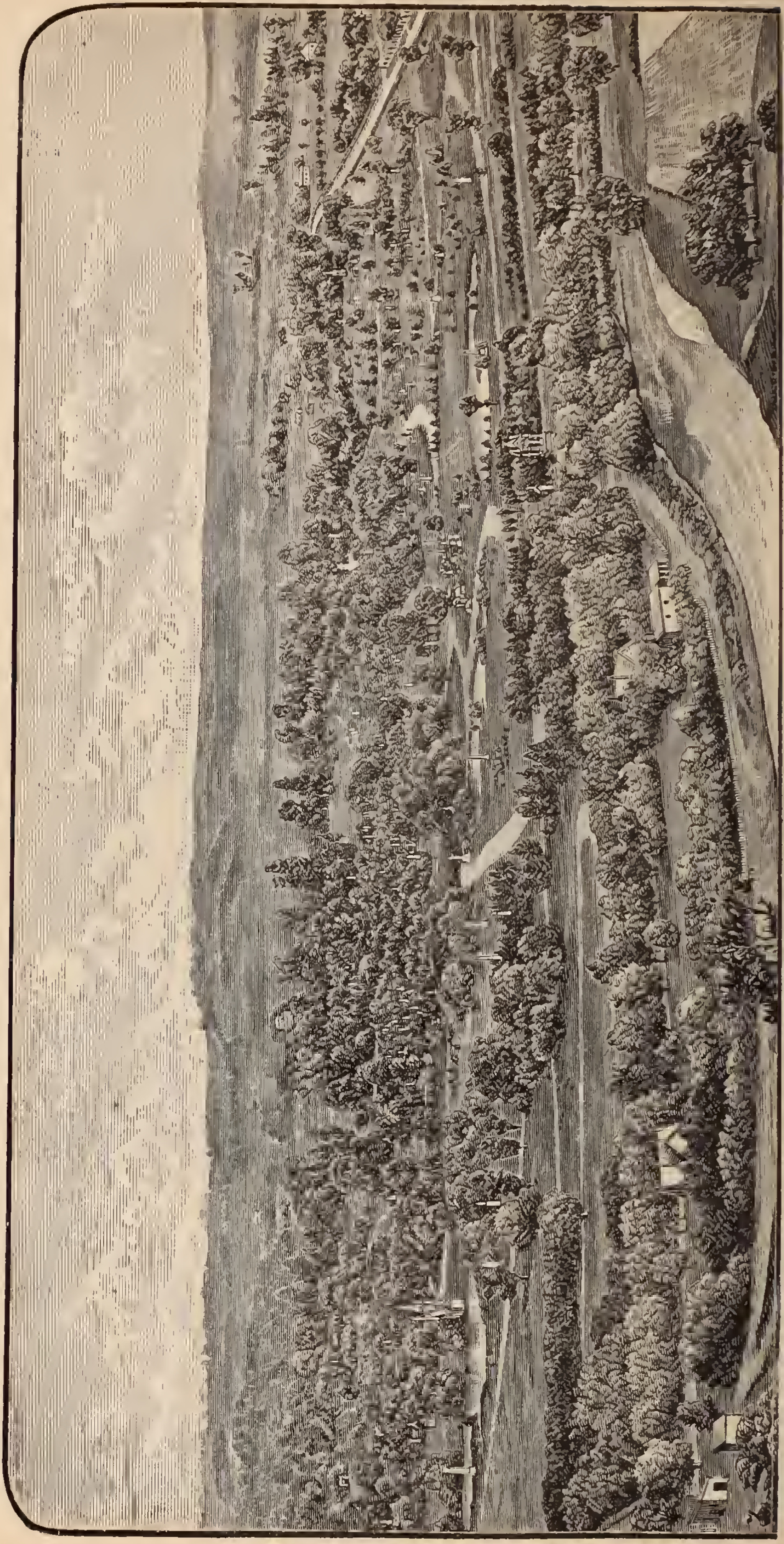


FIG. 197. *Bird's Eye View of Spring Grove Cemetery from Clifton, the Highlands directly East of the Cemetery.*

and new styles of lawn architecture into one, and that one his own. When Mr. Strauch took charge of the place he found all the best portion of the ground selected and improved in a multitude of ways, while a series of unsightly swamps and bluffs formed the bulk of the remaining land. Now, some of the most desirable locations occupy the then waste ground, and the unsightly and miasmatic swamps have disappeared, and the water reduced to a small area, in deep and beautiful lakes, interspersed with numerous small islands, the largest of which has been donated by the corporation to Mr. Strauch as his family burying ground. This island is a marvel of beauty, a real fairy land, with a beautiful statute of Egeria near a grove of Louisiana cypress, in magnificent form and foliage. There are many things we naturally expect to find in all cemeteries; for instance, we expect to find a few flowering plants, striving through the hot and dry summer months to obtain enough nourishment and moisture to retain their vitality, or certainly, a rose bush, if nothing more, which, from neglect usually presents a sorry appearance. If the lot owner is rich the probability is there is a more or less expensive fence around his lot, and the neglect to place a marble slab at the head and foot of a grave, would be thought little less than barbarous.

With these thoughts in mind we suggested that it would be difficult, in many places, to prevent lot holders from planting flowers on the grave of a friend. "We cannot prevent it," he said, "but by allowing them to plant one year, if we keep the adjoining lots with their fresh coat of green sod well mown and clean, one season convinces them that our plan is the best."

Immediately in front of the residence, and on a high bluff overhanging one of the lakes, are still standing a grove of native forest trees and shrubs, which claimed our first attention after leaving the house. Here we found the most magnificent collection of shrubs and young trees it is often the privilege of seeing accumulated in a single group. This is the nursery, and all young or sickly trees are first grown here. An enumeration of choice things found here would be impossible, but we noted among other thing 500 Rhododendrons, mostly in bloom, 500 Himalayan Kalmias, many in bloom, hundreds of hardy Ghent Azalias, also in full bloom, new and rare Evergreens from Japan, Cypress from Louisiana, *Pinus Laricio* from Spain, with *Pinus Rubra* from Lake Superior, *Pinus Cembra* from Siberia, *Pinus Pumilio* from the Alps, *Pinus Mughus* from Switzerland, and *Cedrus Libani* from Palestine.

From the nursery we commenced a tour of the grounds, and among the choice trees noted was *Pinus Excelsa* 35 feet high, with perfect cones already set, a Weeping Juniper 20 feet high, and of dense growth, Scarlet Beach, Scarlet Birch, Scarlet Oak, Scarlet Maples from Japan, Golden (*Aurea*) and Silver (gray) Evergreens, of many varieties, too numerous to mention, while Magnolias, Tree Box, English Hawthorn and commoner things were represented in immense variety and quantity. To almost any one the sight of the Cypress from Louisiana and *Pinus Rubra* from Lake Superior, *Pinus Bhotan* from the Himmaleh Mountains, or *P. Strobus* from the White Mountains of New Hampshire, growing side by side without protection, would not seem creditable, but such is the case, and the situation seemed to suit them all. Of course the system of planting trees from the far north to protect the tender varieties from the south has been carefully studied before, but usually, with only partial success, but here it has been successfully carried into effect. The rules of the Association do not allow of a promiscuous erecting of marble headstones, but a strong encouragement is shown to assist in planting a memorial tree in the centre of each lot, with the graves to be arranged in a circle around it. The first President of the Association, Robert Buchanan, has no marble monument to mark his grave, but has a choice specimen of Scarlet Oak planted at his head. The grave of Judge John McLean, the orator who delivered the address at the consecration of the grounds, in 1845, is marked by a Chestnut Oak. Judge Storer's grave is only marked by a Hophornbean, also planted by Mr. Strauch. This scarcity of white ghostly marble and the great abundance of rare, beautiful, well shaped and well grown trees and shrubs, producing a cool and refreshing retreat on a hot summer day, is the glory of the place. Stand where you will and look in any direction you choose, and the scarcity of small monuments but abundance of large ones, will give the idea of a grand park, a place to go and be cheerful, even though you know a friend lies buried near by. In all our wanderings we saw only one lot fenced in, and noted the name "Brachman." There may, however, be others, but we did not see them.

Spring Grove has its sad memorial of the late war in the form of three circular mounds, in the centre of each of which is planted a large cannon as their monument. Around this monument the graves are arranged in a circular row, and the ground sodded over and kept smooth and clean. No head stones mark the graves, but as all circles of graves are numbered from a certain point, and a complete record kept both at the city office and also at the cemetery, no difficulty is experienced in finding any grave at any time by those in charge of the place, but unauthorized persons would be at a loss where to look for it.

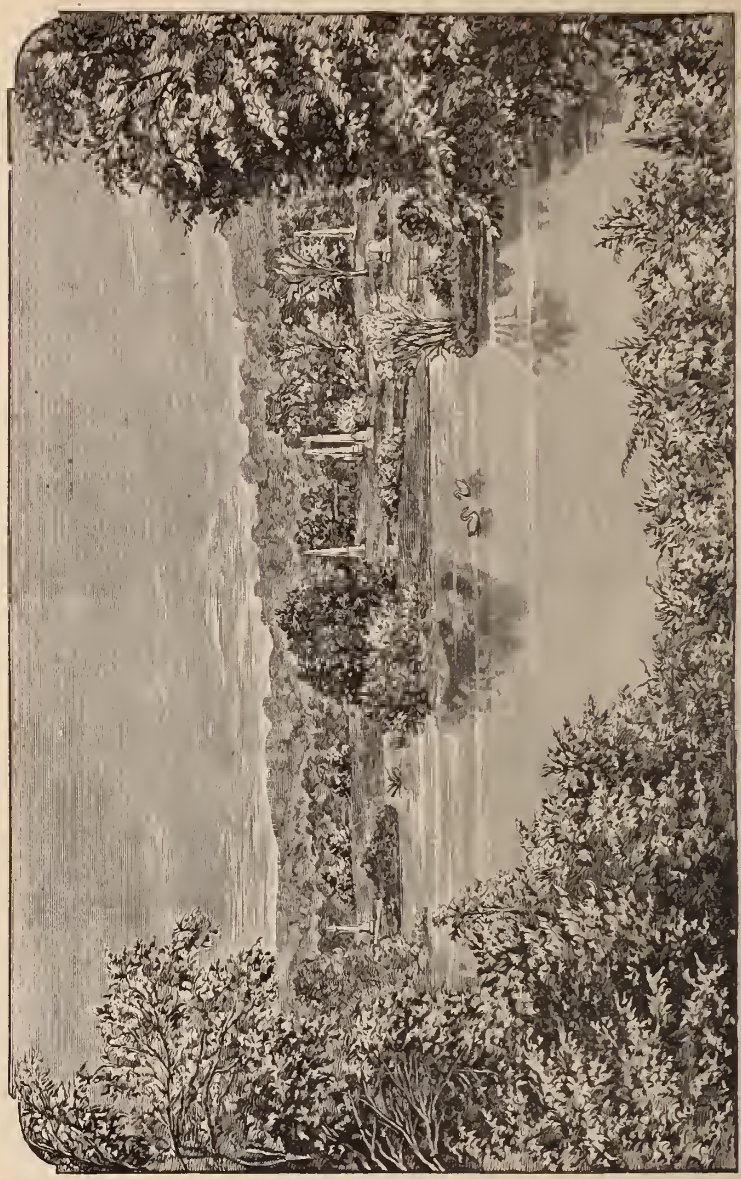


FIG. 198. A VIEW IN SPRING GROVE CEMETERY, CINCINNATI, O., AS SEEN FROM THE GRAVE OF THE LATE CHIEF-JUSTICE CHASE.

(The Tyler Davidson, Resor, Shillito and Stone monuments are seen in the engraving.)

Mr. Strauch has devoted his whole life to the study and work of landscape gardening, having spent many years in Vienna, Berlin, Luxemburg and Regents Park, London, under some of the best instructors the world ever saw. He will also tell you in his inimitable way that he was compelled to work for Louis Phillipe on the fortifications of Paris, "but" he says "My countrymen have taken the trouble to go there and tear them down." When he came to America, his first work was the remodeling of R. B. Bowler's place, which he left to take charge of Spring Grove near by, but only upon conditions that he should be allowed to carry out his views of changing the prevailing idea of a cemetery, i. e., a combined, neglected flower garden, and an unlimited number of profane and ridiculous memorials and toys, often crowded together until it resembles a marble worker's *show lot* more than a *City of the Dead*. His ideas of a rural cemetery, as typified by Spring Grove, are not only appreciated by the people of Cincinnati, but are accepted by competent judges all over the world as the true mode of cemetery architecture where it is possible, and is cited by writers of the old world as the only one attaining a point of superiority; indeed *The Garden*, of London, has a series of wood cuts made from photographs of Spring Grove, in 1876, to illustrate this mode of lawn gardening.

It was no part of our plan to speak of any of the choice and exquisite works of art, as exhibited in the marble and granite monuments and columns, and we will only say Spring Grove contains some of the most beautiful designs as well as elaborate work to be found anywhere in the country. But as we have left the subject so very incomplete, perhaps we will, at some future time, give more details of this lovely place.

ROESSLER'S PORTABLE WIRE PLANT-PRESS.

AS DESCRIBED BY PROFESSOR D. C. EATON.

IT is always a pleasure to place before our readers anything of interest, and especially what we feel sure will be very useful and appreciated by many. A short time ago we received from Mr. Roessler a circular containing just the information many of our readers desired, and with his consent we reproduce it entire. We will also add for the benefit of Botanists and Collectors that Mr. Roesser keeps on hand a full supply of Botanist's requisites in great variety, and can furnish anything not in his stock without delay.

A few years ago, Professor Alphonso Wood described in the "*Bulletin* of the Torrey Botanical Club," a wire or wire-netting botanical press, which he had found of great service while collecting plants in California. But it does not appear that any presses of Professor Wood's pattern were ever manufactured for sale.

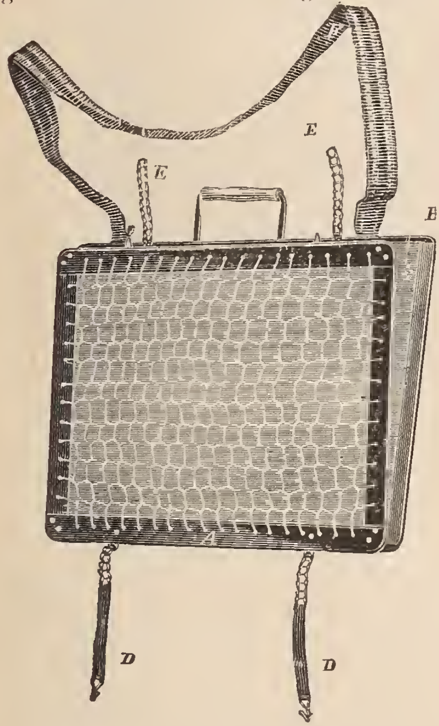
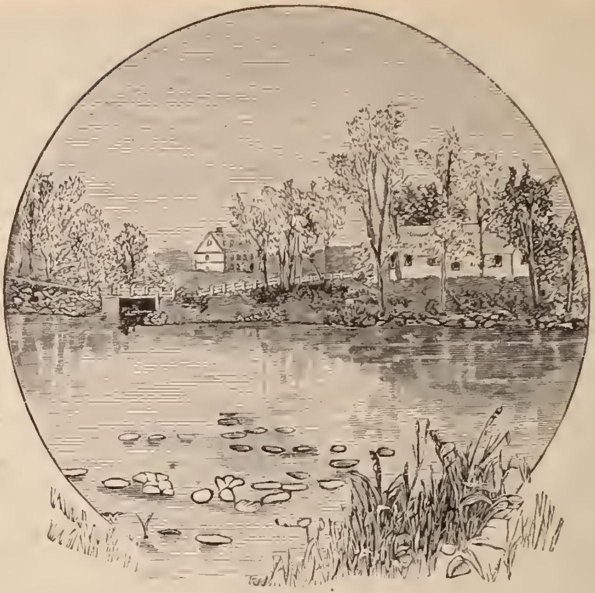


FIG. 199. *Roessler's Portable Wire Plant-Press.*

Mr. Paul Roessler, of New Haven, Conn., has now, however, perfected a wire botanical press, something like Professor Wood's, but more like the presses used in some parts of Germany. It will be seen from the accompanying engraving that instead of a heavy wire border, the border is of thin strap iron, A, which is perhaps an improvement.

One side of the press is furnished with chain-work straps E, and the other side with four little hooks, projections, to which the chains may be fastened, by any one of their links, with no trouble, so that whether empty or full, the press will securely hold and compress the contents. Elastic straps, D, at the ends of the chains, are furnished with hooks to secure the chains, so that the press cannot be thrown open by accident, but may be opened and readjusted without delay. The presses have their sides of knitted wire-work drawn tight, and are handsomely japanned, so that they will not rust. They may be carried by either a handle or strap, as seen in the figure. Presses or portfolios of this kind have the very great advantage of permitting evaporation to go on from the sides, while board presses depend entirely on absorption by the dryers. I have found by the use of a press of this kind, even kelps and rockweed (*Laminariæ* and *R. Fuci*) may be readily dried, especially if the press be placed in a current of heated air, as for instance, over a common hot-air register. These presses are made of just the proper size to prepare specimens suitable for the common size of the American herbarium paper, 16⅜ by 11½ inches.



WATER LILIES, RANUNCULUS.

ORDER—*Ranunculaceæ.* Linnæus. *Pliny.*
TYPE—*R. Acris*, and bulbous. Linnæus.
ETYMOLOGY—From *Rana*, (Greek) a frog.

[Ninth Paper.]

AMONG the first plants enumerated and described in modern botany are those comprised in the (first) natural order, *Ranunculaceæ*, (Linnæus, Order 13,) of which *Ranunculus Acris* and bulbous, may be considered as the types. It is one of the most widely distributed as well as abundant in genera and species, being found in more or less abundance from the Equator to the shores of the Arctic Ocean and Greenland in the north, to an almost equal distance south. The genus *Ranunculus* alone contains over 200 described species, and of the 30 or 40 other genera in this order, some contain nearly as many more. As a rule they are found in cool, moist or partly shaded places, while a few species are decidedly aquatic, and will form the subject we propose to treat of especially in this paper.

According to Sir Joseph Paxton there are a dozen aquatic species in Great Britain, one in Hungary, two in Europe, one in Siberia, one in New Zealand, and four in North America, that are thoroughly aquatic, while nearly as many more inhabit low or wet grounds or ditches. As a rule the flowers are small, being no more than one inch in diameter, while the prevailing color of the whole genus is yellow or white flowers, an exception, however, being in *R. apiifolius*, from Bonaria, with whitish-red flowers, and *R. asiaticus* variety *sanguineus*. from Syria, with scarlet flowers.

The best known of all the foreign aquatic varieties is *R. acquitilis*, Linn., Fig. 201, originally from Great Britain, but now very generally distributed over the whole civilized world. In this species, which is often from one to two feet long, the lower portion of the stalk and a few leaves are usually submerged, while a small portion of the growing end, with leaves, together with the flowers, are above the surface of the water. The leaves that vegetate in the water are divided into narrow or linear lines, so narrow indeed that they seem to be leaves reduced to their nerves or skeletonized, while those leaves that grow in the air are entire and disc-like in form and more or less notched. All the leaves are circular in outline, or nearly so, and do not collapse so completely as the American form *R. multifidus* does, upon being removed from the water. The flowers are white, from one and one-half to two inches in diameter, and are borne singly on long and remote stalks from the axils of the leaves during July and August. On the inner surface, and at the base of the petals, is a single, naked, yellow hony pit.

Our American species, *R. multifidus*, Pursch., Fig. 202, is perhaps the best one to select as a type for the aquatic section of the genus, of any one we can find. Here we have a hardy, native perennial aquatic plant, growing in shallow, slow-running water or small lakes of fresh water, with a bundle of long fibrous rootlets, centering in a crown, from which spring usually one (sometimes more) slender branching procumbently floating stems, from 10 to 20 inches long, with numerous alternate, clasping or sheathing petioled leaves, the petioles (stipules) broadly dilated at the base, and enclosing the *node* or joint, from which spring the branches. These branches and stems seldom rise above the surface of the water but always appear floating, and are terminated by a single yellow flower in May, June and July. The leaves are reniform (kidney-shaped) in outline, but are repeatedly divided up into long narrow, three-forked, filiform divisions and present a feathery appearance in the water, but collapsing into a tuft immediately upon being drawn out of water.

In a copy of *Comstock's Illustrated Botany* before me is a paragraph on the flower of *Ranunculus*, which tells the story so plainly that we copy it entire: "Let the reader take an individual of this species, while in blossom, and examine with us the parts of the flower. The petals are five, of a brilliant yellow, and underneath them are the sepals of the calyx, also five in number, like small hairy leaves. Upon separating one of the petals, near its base, on the inside, will be seen a little nectariferous pore or sac, from which exudes honey, and which is covered and protected by a small scale. Within the corolla are the stamens, which are, with the sepals and petals, separately inserted into the receptacle. In the centre of the flower, are a number of little green grains, collected together, and seated on an elevation of the receptacle. When examined by a magnifying glass, they are found to be rounded at the bottom, and contracted into a short, curved horn at the top. Each of these grains is a single *carpel*, the horn-like top is the style, and the tip of this, which is somewhat broader, and more shining, is the stigma. Each carpel contains a single ovule, or young seed. When young, the ovule occupies but a small part of the cavity of the carpel, but afterwards fills it entirely. After the calyx, corolla, and stamens have fallen off, the cluster of carpels remains, and ripens into the fruit. Their form is not changed, but increase in size, and become dry, hard, and brown. In this state they are ordinarily called seeds, but in reality as we have seen, they are only the seed vessels, each containing a single seed. If one of these be cut through with a sharp knife, the inside will present only a mass of white flesh, which is the *albumen;* unless the division has been made exactly through the centre, from top to bottom, when a very minute oval body will be seen near the base. This can be taken out by the point of a needle, and when submitted to the microscope, proves to be the *embryo*, or the part which grows when the seed germinates, and is composed of the *plumule*, or rudiment of the stem, the *radicle*, or part which forms a root, and the *cotyledons*, which are the beginnings of leaves."

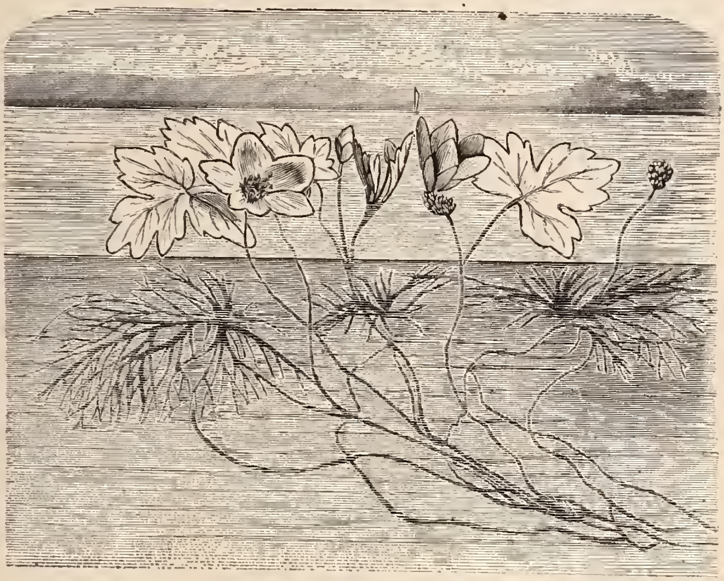


FIG. 201. *Ranunculus Aquatilis.*

It is often noticed that the small and narrow sections of the leaves are narrower

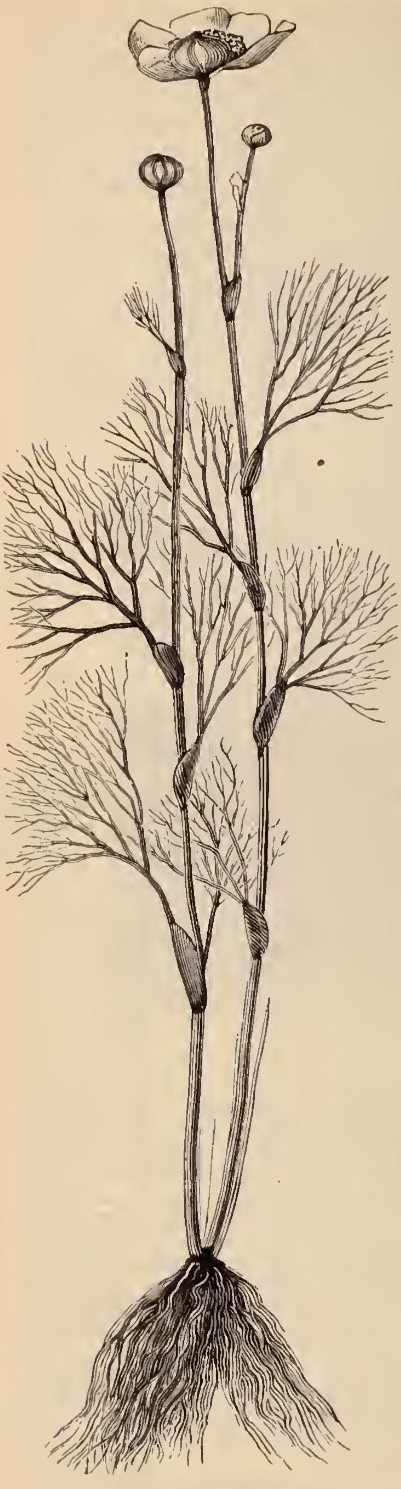


Fig. 202. *Ranunculus Multifidus.*

and more thread-like when growing in running water, or if from any natural cause (a freshet or sudden rise of water) their conditions from a quiet and almost motionless situation are changed to an agitated one, the leaves appear to assume the filiform character almost immediately. But while they will not thrive in swift running water, they will also not survive a stagnant or foul basin or pond of water, but immediately perish. Neither will they live under the shade or drippings of trees, but must have a free circulation of fresh air and the morning sun, and then they will grow in great luxuriance and produce an abundance of flowers. American landscape gardeners as a rule seldom attempt to introduce small lakes or ponds in their parks and grounds for any other purpose than as an ornament, a fish and duck pond, or if the place is large enough, for pleasure boating, hence we seldom realize the great worth in some of our hardy, native aquatic plants. Some of the garden species produce double flowers, and are among our choicest hardy early flowering plants, but, so far as we know, none of the aquatic species ever produce double flowers, but their peculiarly rich and attractive color makes them none the less desirable for growing in small lakes or ponds of fresh water.

All the species of *Ranunculaceæ* agree in the essential characters of their juices, when fresh, being watery and colorless, (not milky,) acrid and poisonous if eaten, while the bruised leaves of several species will raise a blister on the skin when applied fresh. Some have a narcotic principle, which has placed them among the list of medical plants, but their use in medicine has never been popular. Cattle will not eat their green leaves, but when dried and used as hay this principle is dissipated, and they are quite eagerly devoured. The roots of many species which are certainly poisonous, are known to have been used as food in many parts of the world after first driving off the animonin, or anemonie and volatile acids by heat. In short acridity, causticity and poisons are the peculiar characters of the whole order.

Pliny tells us (Book xxv,) the Greek have 4 varieties in use as medical plants, and from them make 14 remedies for diseases, principally for blistering and all caustic preparations. He also gives two other names by which it was known among his countrymen, viz: *Batrachion* (frog-plant,) and *Strumus*, (scrofula-plant,) but he says "we," probably, medical practitioners and students, call it *Ranunculus*, (crow-foot).

But many of our readers may object to our calling the above species "Water Lilies," as they are so small and unpretentious, so we will finish this article by a brief notice of the newly introduced (into England) species, *Ranunculus Lyalli*, the long talked of Water Lily of the New Zealand shepherds. This rare and beautiful species has long been known to exist in New Zealand, but has never been seen in cultivation until collected by Peter Veitch in its native habitat and forwarded to the celebrated new plant merchants, James Veitch & Sons, London, England, and who have succeeded in growing them to maturity and exhibiting a superb specimen of it in flower at the exhibition of the Royal Horticultural Society at South Kensington, (England,) May 13th, 1879. We give a figure of the plant and flower, taken from *The Garden*, as also their description, which says: "As a species it is allied to the very few which are characterized by their shield-shaped leaves of leathery texture, and measuring 15 inches in diameter, and by erect stems. The flower stems are about a foot high, branching and bearing saucer-shaped, pure white or cream-colored flowers four inches across, with a central tuft of golden-yellow stamens. The Chelsea specimens (on exhibition) are necessarily in an immature state of development, and in their present condition they considerably resemble *Nelumbium speciosum* in miniature, except that the flowers are of the purest white, with the central tuft of golden-yellow stamens which much enhance their chaste beauty. Its native habitat is in moist places in the Southern Alps of the Middle Island, (New Zealand,) where it is said to attain a great size. As it is found at considerable elevations, we may presume it is quite hardy in our climate, and now that such satisfactory success has attended its culture, after so many repeated attempts at various times to grow it, we hope that such a desirable acquisition will never hereafter be lost to our gardens.

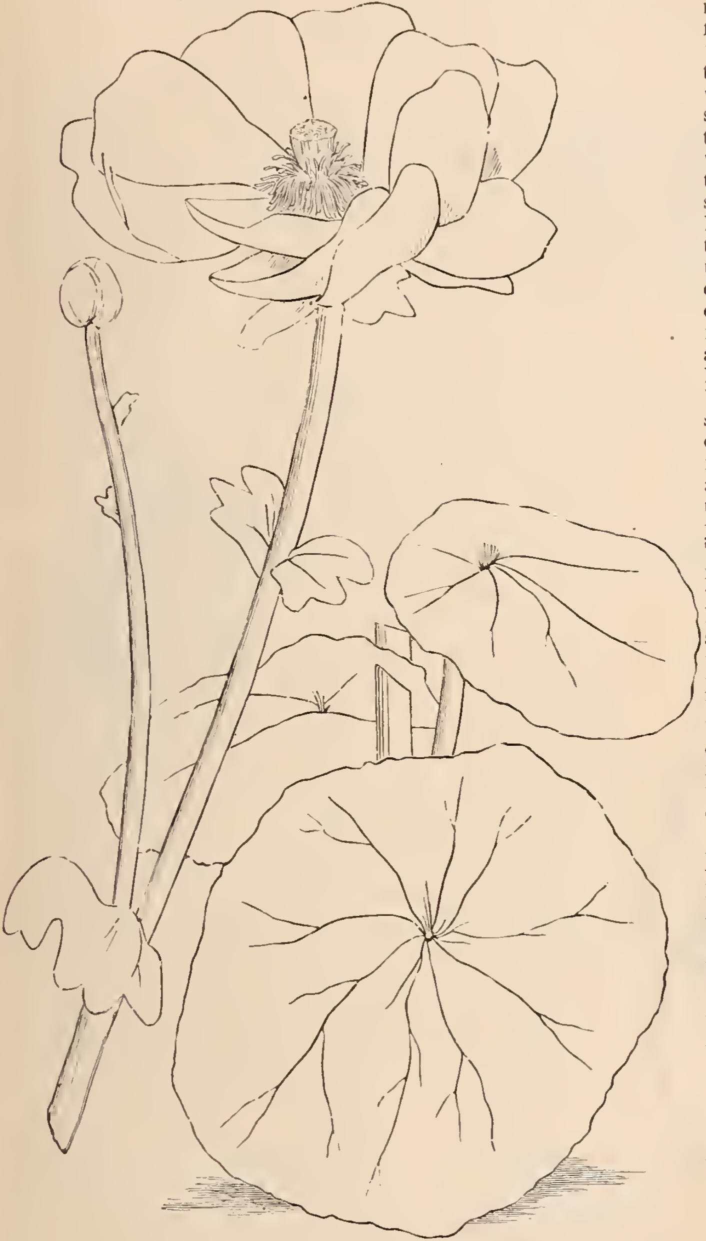


Fig. 203. *Ranunculus Lyalli.*

DAHLIA. CAVANILLES.

TYPE—*Dahlia* (*Syngenesia*) *superflua*—*Compositæ*, *Asteraceæ.*

SYNONYMS—*Georgina*, (WILLDENOW.) *Syngenesia*, (LINNÆUS.)

ETYMOLOGY—Dedicated to the memory of Andrew Dahl, a Swedish Botanist and student of Linnæus.

GENERIC CHARACTERS—Involucre, double; exterior, many-leaved; interior, eight-parted; receptacle, flat, chaffy; flowers of the disk, tubular, hermaphrodite; those of the ray, ligulate, female or neuter; achenium, naked; leaves, opposite; roots, perennial; habitat, Mexico.

DESCRIPTION OF SPECIES—*Dahlia superflua*, (AITON,)—Cup 12 to 15, standing two rowed; point skinned, clotted at the base and covered with scales underneath. Bottom of fruit set with longish skin, chaffy leaf, flat. Fruit fastened longish, reversed egg-shape, pressed together, and without seed crown.

Dahlia variabilis, (WILLDENOW,)—Roots thick, spindle-like; stems knotty, fleshy, tufted at the ground, somewhat wooded, hollow, with long and slender branches; height two centimeters and upwards. Leaves large, irregularly divided into parts, with sharp pointed, oval, dented, and drooping leaf. Flowers are fixed on a shoulder, the stalk thirty centimeters long. From the stem-plants the flowers were somewhat smaller, with an roundish-yellow shade and a single streak of violet, red or orange–colored ray floweret, with sharp-rounded flower leaves.

Dahlia crocata. FIG. 204. Stem erect, fleshy, hollow, branched in the upper part; lower leaves bipinnate, or tripinnate; leaflets ovate, acuminate, obtusely serrate; achenia linear.

TRANSLATED FROM THE GERMAN OF MAX DEEGEN, JR., II., BY WM. H. HANSCHE.

FROM the above species was the Dahlia cradled to its present perfected form and flower. In 1784, through Vincent Cervantes, professor and director of the Botanical Gardens of Mexico, it was sent to Madrid, to Cavanilles, a Spanish monk, and director of the Botanical Garden of that city, where it was also first given the name Dahlia, although later, Prof. Wildenow, who evidently had not ascertained the priority of Cavanilles, changed it to the then more used German term of "*Georgina*," in honor of his friend Georgi, of St. Petersburg, the name Dahlia, nevertheless, being the correct one.

In the following years by cultivation and improved seedlings the colors and forms had multiplied, so that after twenty years a much greater perfection was obtained. From Spain this Mexican plant journeyed to all civilized lands. In 1787, to England, in 1802, to France, and in 1804, was through Humboldt and Bonpland, brought to Germany. They were also the first to bring the seed of the red and orange colored varieties from Mexico to Berlin, where through Director Otto, of the Botanic Garden, it was hybridized and cultivated to larger proportions, and to whom the thanks are due for the lovely and beautiful changes it has received, although it had previously been known in Dresden since 1800. However, when Garden Inspector Hartwig, of Kalsruhe, in the year 1808, grew the first full one, its lustre-stroke was dated from. In 1812, the Dahlia, through Gardener Vogel, of Weimar, was brought to Erfurt. In the same year Haage himself grew the first somewhat full flower, which was of a violet color, and pointed-leaf shape, at Leipzig. In 1824, Christian Deegen, of Kœstriz, with a collection of twenty Weimar grown plants, commenced the growing of Dahlias, which gave to the venerable old grower of the Kœstrizer Dahlia race, in 1826, the first evidence of his superiority, after his industry and culture of this flower for 54 years. Now, at the advanced age of 84 years, he has lived to see it grown to perfection.

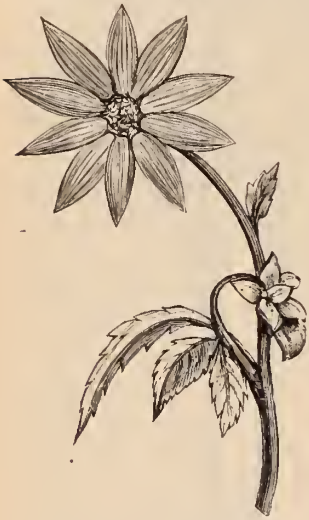


FIG. 204. *Dahlia crocata.*

From 1830 to 1836 the English growers became masters of the cultivation. From this time on Germany was visited with success, and in Erfurt, especially, was this success to be questioned, when such principal growers as Schmidt, Haage, Tischinger, etc., stepped forward. In 1836 the first large German exhibition of Dahlia cut-flowers was held before the Jena Society of Naturalists and Arts, by Christian Deegen, in Kœstritz, who had over 200 of his own sorts and cultivation on exhibition, of which there were, namely: the brilliant *Grand Duke Alexandra Paulowna*, of a delicate flesh-colored white, and *Alexander Humboldt*, of a blood-red. Alexander Humboldt, who was present in person, expressed his gratification at now beholding this simple Dahlia, which he had brought from Mexico, in such lovely changes. After a brief time the English growers complained of their cultivation, in an exhibition of Dahlias at Stafford House, September 25th, 1839, that their newest flowers had had the following defects, viz: Hanging flowers, leaves folded too hard, irregular center, bad colors, deficiency at the body, and an inclination to star forms.—*Horticultural Magazine*, November, 1839.

As second in the trade, John Sickmann, a Dahlia grower for forty years, grew as new varieties: *England's Rival*, in 1849, *Triumph of Kœstritz*, in 1859, *German Sons*, etc. The high estimation in which the German Dahlia growers were held after this time brought out: Mardner, in *Princesse Alice*, *Perle*, etc.; followed by Holbenz and Engelmann, in *German Empress*, *Pet Son*, *Little Goldelse*, *Star of Germany*, etc.; also, C. H. Muenschen, in *German Emperor*, *Director Raspe*, *Zoila*, *Fireturban*, etc. After a study and experience for 15 years in the culture of the much improved Dahlia, came Max Deegen, jr., II, of Kœstriz, in 1871, who as a successful grower of this flower while in his father's (Christian Deegen's) employ, and after years' of experience, grew the following: *Ernest Schleicher*, *Lady Emma Deegen*, *Teacher Sachse*, *Max Deegen's Pupil*, *Flower Princesse*, etc. These were sent to the leading growers abroad, in order to have them brought more generally to notice and strive to surpass the three Kœstritz rivals. He also brought the culture of the Dahlia, in Germany, to a higher degree, in order that they altogether might surpass the foreign growers, and bring Kœstritz as a center in point of culture and shipping, and himself enjoy the honor of being Germany's distinguished Dahlia grower.

England and France grew mostly the large flower varieties: *Victor Duflot*, *Virginclis*, *Vulkain*, *Phedre*, *Prince Broignard*, *Le pere Coelesta*, *Mad. de la Marshal de McMahon*, *Mandarin*, *Roundhead*, *Leah*, *Prince of Wales*, etc. On account of the rich colors and great giant body of their flowers, (Exhibition Dahlias,) they were well marked, although mostly of a roof-tile form, errorless, inclining to nod, late and not bearing flower blossoms; grew vigorous and robust in leaf and stem, but were tall and bushy when grown. Therefore, we can say that the German Dahlia, with its elegant low bush and many perfect flower forms, is handsome to look upon, especially when carried on a high, upright or horizontal slender stalk, which, only like a lady who is timid, is necessary to grasp it under the chin in order to lift its head. When in early summer its rich blooms reach the highest point of its perfection, it remains for German industry and energy the best proof and undenied result to be the representative of Kœstritz. One may look for and obtain the old Dahlia from 2 meters high to only a half meter, which as a dwarf bedding Dahlia is possessed of a pre-eminence and luxuriance of growth, and through its terseness and self dependent habit, makes a good impression before the eyes. It would, no doubt, be preferred mainly for pot culture, as for *Georginan* groups at garden entrances, border beds, parks, grass plats, etc., as round plats, stars in ornamental forms, planted in the foreground of thickets, or to lay out other garden groups, as the nicest ornaments. Giant flowers, measuring 15 centimeters through and 8 centimeters high, to the smallest flower, resembling a *Bellis perennis*, with flowers from 2 to 5 centimeters in diameter, which, lastly, are named Liliput Dahlias, (*Pomponea petite fleur*—Bouquet Dahlias,) whose extraordinary low figure, gracefulness of form, and elegance of growth, were filled with the largest of blooms, harmoniously covered with a dense bush. These charming flowers are also used for groups, pot culture, fresh and dried bouquets, and other decorations of inestimable value. Dahlia flowers from 6 to 15 centimeters in diameter and from 100 to 130 centimeters in height of bush are quoted extra in the Gardeners' Trade Catalogues, and are put under the head of large flowering Dahlias, (Exhibition Dahlias,) which through their cleanliness and intensity of color, largeness of flowers, sparkle magnificiently, and possess lustrous advantages through the large unfolding of the bush, entwining itself amid strong growing plants, and occasioning only a small loss in keeping over winter. Many large flowered varieties, with peculiar bright or clean white colors, are grouped singly, or as a center in ovals, sphericals, etc., and very effectful for low groups. As most of the small flower sorts in the growers' gardens are recommended for low prices, they are really from 2 to 5 centimeters in diameter, and are put under the head of Liliputians; the dwarf sorts are also marked as low sorts, when the height of the bush should be from 40 to 90 centimeters. Not only must the height of the bush be measured, but also the head of the flower.

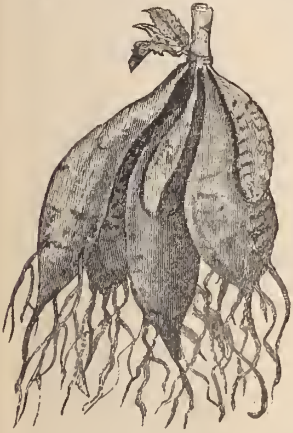


Fig. 205. *Dahlia tubers (root.)*

In all the imaginable shades and clean colors of blue-corn flowers the Dahlia now

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Note—1 meter is 39 37-100th inches; 1 decimeter, one tenth of a meter; 1 centimeter, one hundreth part of a meter, and 1 millimeter is one thousandth part of a meter.

presents itself to the world as the unattained king of colors, and promises it to be inexhaustible in producing an acceptable mixture of colors, or a contrast of two or more, (Fancy Dahlias,) for instance: rosy, with a bordered, clean white center, or vice versa; purple, with a rose center, figured with a white center, or large white points; fiery scarlet, with gold-yellow points, pinkish, etc.; also ground color, with one or more colors, innumerably sprinkled, punctured, striped, banded, etc. As in the great quantities of its colors, the Dahlia was also, by the thoughtful growers, perfected to many forms of flowers, and differed from the original flat shape in the form of the flower-head, in order to make a division ground of the form and position of the only bloom, as in scale, ball, pyramid, rose, turban, chrsyanthemum, aster, ranunculus, pearl, pinnacle, reed, cell and shell forms, etc., and rebind the same again, as for instance, in reed-scale forms, shell-ball and cell-pyramid forms, etc. Many of the flower sorts of these shapes have the appearance of being finished by an artist, the flower leaves being pointed, slit, turned, folded over one another, reeded, arched, bent smooth forward or backwards, rounded with the greatest harmony, and it was in vain that the least unevenness of the growing of the flower could be found. Although not all of the finest forms give an abundance of seeds: still to produce other varieties of merit, only the seed of the choicest and most perfect sorts will produce favorable results. The seed while ripening must be protected from the cold by from 1 to 2 degrees, Reaumur, and if planted immediately when ripe in a moderate situation will germinate about the end of March. After the young shoot becomes well established they should have plenty of air, and about the middle of May should be planted in the free ground as deep as possible. They can also be raised easily, and with profit, in pots. Garden grown plants can be set out at the beginning of May, and pot grown plants, rooted shoots and seedlings, by the middle of May, when there is no danger of frost. They must be planted free about 5 centimeters deep, and after planting, if it does not rain, must be watered occasionally. During the time of blooming the ground can, when absolutely needed, be wet, but never wet the flow-

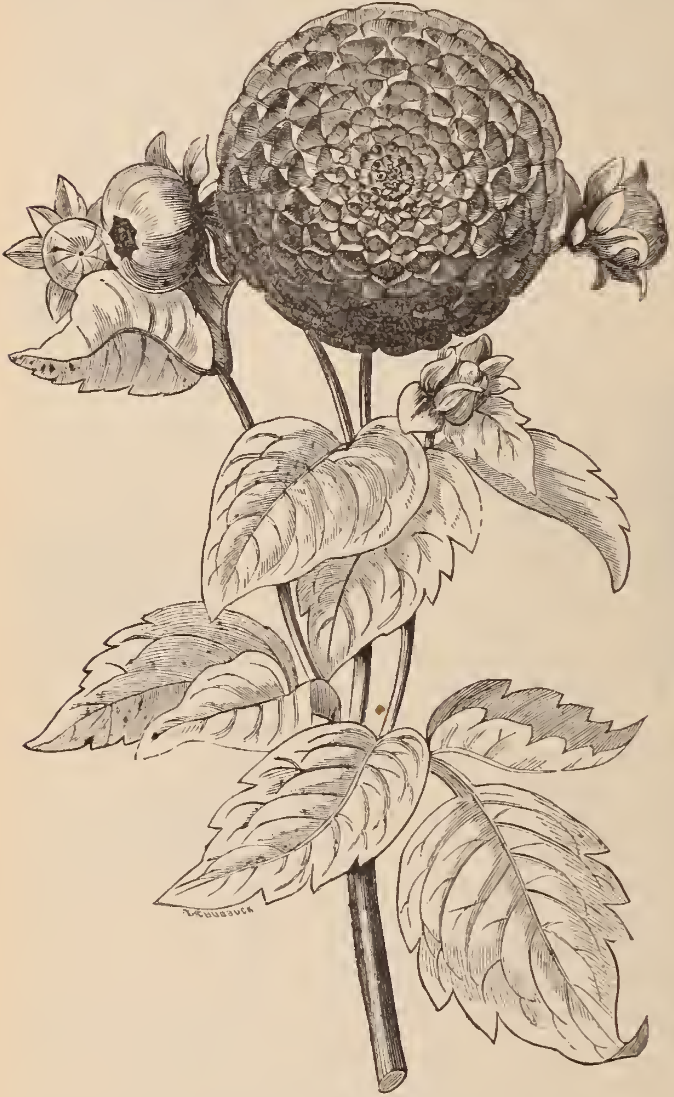

Fig. 206. *Pompone Dahlia.*

ers, as after each rain they lose their color-lustre, and only by the opening of the new flowers, are the bright colors brought back again. Cool, damp autumn days condense and darken many colors to a yet still brighter appearance. If one wishes a real early bloom and a stout bush they will find only garden grown specimens best for forcing to an early bloom. Rooted cuttings planted out do not give such stout and high bushes, but give good, but mostly later blooms, and are for this reason at times wished for. One important item is to separate the larger grown plants and only let one shoot grow as a single plant or bush, and by early and careful tying up of the bush, at the right time, it will unfold an abundance of the prettiest and richest flower blooms. Should there be an early frost in the fall, it would be well to let the plant remain in the ground for several days as it will ripen better. Before there comes many degrees of frost do not neglect to lift out the plant, as the root is liable to freeze easy when too near the crown or wreath of its bud, and its decay can not then be prevented. The right time to cut off the stock back to the bud, to advantage, is when lifting it out of the ground. If in the spring large strong plants are wanted, they should, in the fall, be lifted out with garden forks. When rooted cuttings are planted, lift them in their first year, with a spade, on account of their weakly growth, being careful that the plant does not pull through the hand at the stock, while violently lifting them up, and then, perhaps, with the bud, be broken off. Large plants can be brushed free from earth with a pointed stick, (but not shaken) and then be dried by the air and sun for several hours, while to the contrary, weakly ones must be cleaned immediatly, cut with the dried earth, covered with sand or coals, free from frost and dampness, and be put in an earth ditch of sufficient depth, the upper part being covered with an elevation of earth, over which should be laid extra boards so as to let the rain and snow-water run off. They could be kept in dry cellars, or in earth and green-houses, but not too near a furnace or heat, but always keeping the roots covered dry, and occasionally looking after and examining them.

To increase one must strike in March the January growth, and put direct in a warm bed, or set the same planted in pots, thereon. Cut the shoots from 3 to 5 centimeters in length, with a piece of the old growth, and cut off close under the leaf-knot. Place the stocks in a moderate warm sand bed, (also in the spring and summer, in a cold bed,) or singly, in small pots, with fine sifted, rich, sandy and loamy earth. In the beginning give deep, and later, lighter shade, over the enclosed propagating house or hot beds, where they are growing, watering them at least once each day, so that the roots may become accustomed to the air, and by a satisfactory mild temperature be planted out in the free ground, or else transpose them to larger pots.

The ear worm (*Torficula auricularia* [De Geer]) is the most important enemy of the Dahlia grower, who, with a particular liking and without mercy, will often in a single night nibble a great many of the nicest flowers. The placing of cattle horns and hoofs upon posts in the flower beds, into which they like to creep and hide during the day, where they can be taken out and the brood destroyed, is no doubt, the best remedy to protect the lovely and beautiful Dahlias.

That in so far as this plant carries the correct name of *Dahlia variabilis*, is shown through its extraordinary changeableness and its perfected flower-sorts, being partially or wholly of the original form, then going back and become worthless. In one sort a bush shows itself carrying other colored flowers, or else but a twig on which the same is produced, while sometimes the half of a flower is one color, and the other is variegated, is familiar to judges of Dahlias, but by the persons growing them believing to not have received the right kind of sorts. Soil and climate, together with cultivation are a great consideration, and do not bring about these changes, but in most cases by the barbarous handling of the roots and plants growing them in faulty situations, as for instance, in too shady places, under trees, poor ground, etc., are the direct causes. The earth may be colored and heavy, just so it has strength; liquid and rotten cow dung and manure are mainly used.

Praiseworthy for the progress and cultivation of this flower is shown by the yearly offerings of immense quantities of seeds and plants by the most important Dahlia growers, when one firm alone, in a single year, often gives to the trade 600 novelties, which being assorted over, will be reduced to about fifty, after which great numbers of the novelty sorts are then made into parade troops. In relation to the names of these novelties, one can find them in the then following Catalogues of the firms, for to find names for such quantities of novelties, makes it somewhat clear that many of these sorts are "unaccountable laughably" named.

Nature only affords the nicest and hardiest little by little. By diligence one only obtains, after a time, the longed for accomplishment. Through these means the *Dahlia variabilis*, (*Georgine*) which for the past fifty years, through my father, was first cultivated at this place, and by many years of participation and devotion given to its culture by myself, it has acquired world renown as a flower ornament of the garden. It is my endeavor, through large assortments of new seeds and plants, always to grow more perfect varieties. Any person who has ever visited my present Dahlia garden and seen the blooming of the flowers in the month of August and the beginning of September, with their many thousands of flowers of various colors (like a variegated carpet) and complete forms, always love to observe the place of pilgrimage, and gladly confess that the Dahlia belongs to the most gorgeous and graceful of all cultured flowers, and through the attentive care it has received, is worthy of the greatest wonder.

The following brief history of the Dahlia, is taken from Comstock's *Illustrated Botany*, and will also be found very intersting:

"Few flowers are now better known, or more generally cultivated, than the Dahlia; but notwithstanding its present popularity, its early history is not generally known. The first printed account of the Dahlia is said to be in Hernandez's *History of Mexico*, published in Madrid, in 1651; in which two species are figured, under the name of *Acocotli.* Both of these are single flowers, and one appears to be *D. crocata*, and the other *D. variabilis* or *superflua.* There was, however, an Italian work on the Natural History of Mexico, published at Rome about the same time, which had not only a single but a double Dahlia figured in it. In both these works the plants are described as having tuberous roots, of a strong and bitter taste; and Hernandez says that the Mexican used these roots medicinally as a tonic. It is not a little singular, that a plant so showy as the Dahlia, should have remained from this time unnoticed for a period of more than one hundred and thirty years. Yet such was the case; for the next mention of it is made by M. Menonville, who was sent to Mexico by the French Government, in 1787, to endeavor to steal the cochineal insect and plant from the Spaniards. This botanist only saw some Dahlias growing in a garden near Guaxaca, and he describes them as having large aster-like flowers, stems as tall as a man, and leaves like those of the elder. In 1789, *D. variabilis* was discovered in a wild state in Mexico by Baron Humboldt, and sent by him to the Abbe Cavanilles, then Professor of Botany at Madrid. The Marchioness of Bute was at that time a patroness of floriculture in England, and being in correspondence with the professors at the different botanic gardens in Europe, Cavanilles sent her some of the seeds the same year that he received them. One of the seedlings raised by Cavanilles produced semi-double flowers in October, 1790, and a figure of it was published in the following January in Cavanilles' *Icones Plantarum*, in which the genus was named *Dahlia*, in honor of Andrew Dahl, a Sweedish botanist; and the plant figured, which is the same as that now called *D. variabilis*, was christianed *D. pinnata.* Cavanilles afterwards figured in the same work two other Dahlias, which he called *D. rosea*, and *D. cocinnea.* Tubers and seeds of these three kinds were sent to Paris in 1802, under the idea that the tubers would be eatable; but they were found so bitter and pungent, that they "disgusted both man and beast. In the mean time, Lady Bute had raised, from the seeds sent her by Cavanilles, some young plants, which she kept in pots in a green-house; but in the course of two or three years afterwards, they all died without ripening seeds. In 1802, an English nurseryman named Fraser obtained in Paris some of the seeds of *D. cocinnea*, sent from Madrid, but the flowers produced by his seedlings were bright orange instead of scarlet. Mr. Fraser's plants were kept in a green-house, and died without ripening seed. In 1904, M. Thonin published a paper on the Dahlia, in which he suggested propagating the plant by dividing its fascicles of tuberous roots; keeping the roots in a state of rest during the winter, and allowing the plants to have large pots full of rich earth. In the spr ing of the same year, Lady Holland sent to England, from Madrid, some seeds, which were sown by Mr. Buonaiuti, librarian to Lord Holland, on a hot-bed at Holland House, when some of the seedlings flowered in the autumn of the same year. In 1807, Mr. Salisbury tried some Dahlias for the first time in the open ground in his garden. Thunberg's plant, however, was named in honor of an English botanist, Mr. Dale, and was called Dalea. In 1808, Count Lelieur began to pay some attention to the culture of the Dahlia in the neighborhood of Paris, and he introduced into the garden at St. Cloud, from Malmaison, three varieties, from which he raised numerous others. When the continent was thrown open, by the approach of the Allies to Paris, in 1814, the British amateurs and florists who visited it, were astonished at the beauty of the Dahlias in the French gardens; and since that period, the cultivation of Dahlias has been common, and many varieties have been raised, of great beauty of form and brilliancy of color."

THE WIND at Omaha recently performed a curious freak. Florence and Willow lakes, north of the city, were blown nearly dry, and the ground in the vicinity was covered with dead fish blown out of the water.

NATIVE FRUITS,

GENUS RIBES. Linnæus.

SUBGENUS RIBESIA. BERLANDIER.

RED AND BLACK CURRANTS.

SEVENTH PAPER.

It would be difficult to imagine a thrifty farm-house within the temperate zone, where the influence of modern civilization is felt, without seeing a few (at least) bunches of Currant bushes growing, usually along the side of the garden fences. They are among the first objects of care and cultivation to the settlers in a new country, and usually, the only cultivated fruit for many years afterwards seen about their new place. These bushes must furnish fresh table dessert in a variety of forms for the family during a portion of June and July, while in the forms of jellies and jams they are expected to add much comfort, if not luxury, to the pleasant winter gatherings of friends. To be sure, in the newer portions of the country there are many varieties of edible fruit growing wild, but, as a rule, none of these native fruits are cultivated, and when the season for ripening arrives a general time of wild berry picking is often indulged in by the whole family or often by a whole neighborhood. This is always a season of merry-making, and enjoyed by all, both old and young alike.

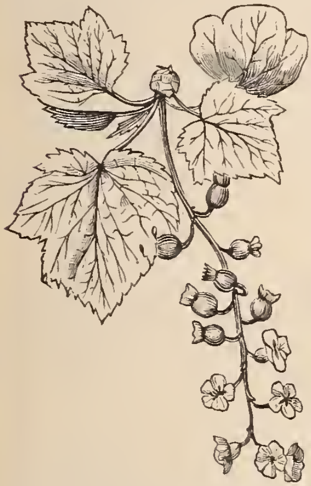

Fig. 207. *R. rubrum, var. albinerium.*

Another very popular use for the fruit of the currant in remote portions of the country, or in early times, was the manufacture of home-made currant wine, and certainly no more nourishing drink was ever made than this simple wine. But the great abundance of grapes and other fruits, more economically produced for wine, has caused the custom of currant-wine making to be now nearly, if not entirely, abandoned. The currant has, however, really been the usual standard fruit for making jellies for the large mass of farmers' wives in times past; and now since the knowledge of canning and preserving all kinds of fruit has become so general, large quantities of currants are annually canned, perhaps, not by themselves very extensively, but by mixing them with an equal portion of other fruit, which contains a less proportion of malic acid.

In a scientific point of view there is very little difference between the Currant and Gooseberry, indeed, both belong to the same botanical genus of plants, *Ribes*, and both require the same kind of treatment, soil, climate, etc. Sir Joseph Paxton enumerates 81 described species, the largest portion being found in the temperate portions of America, reaching from the Straits of Magellan to the Arctic Circle, forming shrubs varying from 2 to 6 feet in height. They are found as far north the 70th parallel in Norway, producing annual shoots 20 inches in length. None of the species are suited for hot climates, in their natural forms, but within the past few years many of the new hybrid varieties have been introduced nearly to the tropics with marked success. All our cultivated red and white fruited varieties are the direct descendants

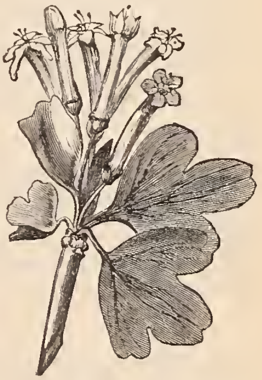

Fig. 208. *Ribes aureum.*

of *Ribes rubrum*, Linn., from the north of Europe, but the same species, according to the generally accepted classification of botanists, also inhabit the northern portion of America, others, however, consider *Ribes rubrum*, of Europe, and its American prototype, *Ribes albinervium*, Michx., specifically distinct, but as there is so very little difference it seems hardly worth while to keep them separate. The special points of difference lie in the fact that in the latter form, the veins of the leaves are whitish underneath, and each berry of the bunch of fruit seems to turn up and assume a very unnatural position on the drooping raceme. In studying the varieties with black fruit we also find a native variety, *R. floridum*, so strongly resembling an European species, *R. nigrum*, that, perhaps, one specific name would reasonably answer for both forms. At least the resemblance is so strong that it is often remarked.

Few of our native species have been improved to any extent, and, perhaps, we may assign as the most probable reason that the foreign ones had already reached such a high point of perfection, at least a century ago, that the attempt seemed useless. There are, however, several worthy sorts from the native stock of real commercial value, but as we already have such splendid and complete manuals on the Currant from the able pens of Downing, Elliott, Hooper, Barry and Fuller, that it would be superfluous for us to enter into anything like an elaborate description of the varieties in cultivation, add to this the fact of the native species being so carefully worked up and described in Prof. Gray's and Woods' Botanies, all our readers are very likely to be quite familiar with them.

The popular name Currant, as applied by the English speaking people to this fruit, is derived from the word Corinths or Corrans, which was applied to the small Zante Grape, of Greece, and which, in its dried state, at the shops so closely resemble in form and flavor the dried Currants. All nations, however, have a popular and distinct name for it, and the Latin (scientific) name *Ribes* is only a modification of the Danish name *Ribs*. The Hollanders were the first to improve the fruit of the Currant, and their old varieties, Red Dutch and White Dutch, are still standard varieties, although some of the newer French, English or American varieties are a little more attractive. They are very easily propagated by simply cutting off a branch of ripe wood of the past season's growth, any time after the leaf has matured, in the fall, and until the plants commence to grow in the spring, and planting it upright in the ground about 4 inches deep, with the growing end about an inch above the surface of the ground. The fruit of the red varieties are borne on the wood, 2 or more years old, but on the black fruited varieties the fruit is produced on the 1 year old wood. The bushes will live to a great age and fruit quite freely if the diseased and superfluous wood is kept cut away, but when they show signs of disease or rust they should be immediately dug up and burned. Being so very hardy it follows, as a rule, that they should be grown in a cool place, and are found to succeed well when partly shaded; but they should never be planted where they will receive the drippings of trees, for in fact, no plant or shrub ever grows satisfactorily that is so situated.

The garden varieties of the Currant are legions, but when carefully compared, are found to be reduced to a very few distinct foreign varieties, while those produced in America are, still less. Among the American productions of merit are: Buist's Long Bunch Red, Dana's White, and from the native black ones are: the Desert and Golden, varieties of *R. aureum*, and the Missouri sweet fruited, a variety of *R. floridum*. Nearly all large and prosperous nurseries keep many other varieties, which soon merge into some of the original species or older varieties.

Although the fruit of *R. aureum* is not desirable to eat, or at least requires cultivated taste to admire it, the plant is one of choicest ornamental shrubs, producing in early spring their clusters of long, tubular shaped yellow flowers, Fig. 208, that scent the air with their spicy, clove-like fragrance. Being a native shrub, of course it is not as desirable as many introduced, but inferior things. Another species, *R. sanguineum*, with its numerous varieties, comes from Oregon, and furnishes a blue fruit, more or less insipid or tasteless, but is another beauty on the lawn. The flowers are produced in great profusion in a long raceme, of a deep, rich, rose-red color, the racemes usually twice as long as the leaves, the calyx has a long bell-shaped richly colored tube, with blunt spreading segments, much larger than the small pale-colored petals. In its native habitat it grows only about two or three feet high, but under cultivation it often reaches as much as eight feet in height, and forms one of the most attractive objects on the lawn.

An Historic Orange Tree.—The famous orange tree at Cassel, which was riddled with bullets by the Cossacks on September 30, 1813, has at last died. The *Hessische Morgenzeitung* writes that even last year the tree bore new leaves and new blossoms.

LAURUS (LINDERA) BENZOIN.

BENZOIN ODORIFERUM. (FEVERBUSH, SPICEWOOD, ETC.)

L. S. MOTE, WEST MILTON, OHIO.

A LARGE growing shrub, indiginous to a great portion of the United States, preferring rich, moist, shady places. The flowers appear early in spring before the leaves are developed, generally at the base of the leaf buds, are quite inconspicuous, and of a light lemon color, and succeeded by clusters of small oval berries of a light green tint, but on maturity, in the latter part of September, are of a shining crimson color. All parts of this bush have a spicy agreeable flavor, being the strongest in the bark and berries. The young twigs and leaves were often used by the early pioneers of this country as a substitute for Hyson Tea. It medical properties are: a gentle aromatic stimulant, with like tonic properties, and was often used in form of decoction, as an agreeable drink in the treatment of low fevers, and has been used too as a vermifuge. A tincture or syrup of the ripe berries was held to be invaluable in the curative acids in Diarrhœa, (Bloody Flux). Like the red man, it is fast disappearing from the little remaining forests of the lands as civilization advances. In these parts, fifty years ago, it formed a dense undergrowth in our woodland, but now but few bushes can be found. It is a pity that such a valuable shrub should be destroyed.

WANTED.

IN a future number of the INDEX (probably the October, 1880, number,) Prof. Beal proposes to contribute an article on our Native Plums, and he would like to receive specimens of perfect fruit and foliage of the same from different parts of the country, from those having an opportunity of collecting them. Especially would he be pleased to obtain examples of *Prunus maritima*, (Beach Plum,) and *Prunus chicasa*, (Chickasaw Plum,) in both natural and fine cultivated fruit, and also their varieties, as now under cultivation. We hope our friends, who have heretofore contributed to our wants, will make an extra exertion this time to assist in perfecting our knowledge of this delicious fruit. Any note or information addressed to Prof. Beal will be duly appreciated and publicly acknowledged at the proper time. Prof. W. J. Beal's address is: State Agricultural College, Lansing, Michigan.—ED. BOT. INDEX.

THE FRENCH GOVERNMENT AND THE PHYLLOXERA.—The sums placed at the disposal of the Minister of Agriculture and Commerce for the purpose of encouraging research and experiments as to the best way of dealing with the phylloxera amounted in 1879 to 500,000 francs, and this will be increased this year by supplementary grants to 969,750 francs. Of this amount 200,000 francs are devoted to the treatment of diseased vines in the district specified by the superior commission, while 250,000 francs will be given to doubling the grants voted by the various departmental and municipal bodies. Societies and companies formed for the investigation of the disease will also be assisted by bonuses to the amount of 300,000 francs. A further sum of 100,000 francs will be set aside towards encouraging the propagation of American vine stocks and the distribution of new plants and cuttings from the Agricultural School at Montpelier. Rewards to the amount of 100,000 francs will be given for furthering microscopic researches, while 50,000 francs are left for dealing with individual cases.

A NEW PLAN FOR THE DESTRUCTION OF SLUGS was described by Mr. Henzi at a recent meeting of the National Agricultural Society of France. This plan, which was said to be discovered by a gardener at Ville d'Avcray, near St. Cloud, consists in coating a thin board about the same size as a sheet of note paper with old tallow or grease and depositing it on the ground. The board becomes in a comparatively short time covered with the slugs, which may then be destroyed by immersion in spirits of turpentine or petroleum.

THE CITY OF PARIS possess the largest collection of tulips known to exist. It is reported to comprise 2,500 varieties. The collection was formed by the industry of the late M. Boutox.

B. CASE
RICHMOND
IND
CASE
RICHMOND
FROM
J.V. & S.
LONDON

NEW & RARE PLANTS

[We would request any one having new or strange Plants, to send us a notice for publication in these columns.]

THE LATEST NEW ECHEVERIAS.

The following is a translation of new and rare Echeverias, grown and for sale by Friederich von der Heiden, of Hilden, Germany:

ECHEVERIA CARINATA HILDENSIS. V. D. H.

In form, this handsome variety is similar to the well known *E. carinata.* The color of the leaves are gray-white, with a light rose shade, whereas the old *Carinata* has dark red leaves. The bloom is same as *Carinata*, with high flower stems.

ECHEVERIA CARNOSA. V. D. H.

The habit of this plant resembles *E. scheideckeri*, although the leaves are fleshier and very nearly green.

ECHEVERIA DELEUILI. V. D. H.

Dedicated in honor of Mr. J. B. Deleuil, of Marseilles. This plant remains low, and builds an enormous rosette of 50 centimeters in diameter. The leaves are gray-green, partly white, with an altogether light rose cast. The flower-stems, which appear so rich, are rather hardy, and bring forth lovely red and yellow blossoms.

ECHEVERIA DIFFUSA. V. D. H.

The leaves are rather long, somewhat bent back, and edged with a green and lovely carmine. A very distinct variety for collecting.

ECHEVERIA GLOBOSA. V. D. H.

This plant builds a nice, even rosette, which grows three times larger than the well known *E. globosa extrusa.* New and handsome.

ECHEVERIA ROESEI. V. D. H.

Dedicated in honor to the eminent Oldenburg Gardener, Herr H. Roese, of Eutin. A neat plant, with rather fleshy, wedge-formed, bluish-white leaves, that carry small red stems at the point.

ECHEVERIA SEMPERVIVOIDES. V. D. H.

A little, handsome plant, with rich green, brown-spotted leaves, which build a small rosette, similar to the well known *Sempervivum californicum.* Excellent for pot groups.

GNAPHALIUM LEONTOPODIUM. Jacq.

LEONTOPODIUM ALPINUM, EDELWEIS.

This lovely little Alpine with the wooly silvery white Bracteates, is yet little known in our gardens, though the culture is a very easy one. Sown early in the spring in a flat pot, filled with sandy peat mixed with some good loam, and kept moist, it will grow in about a fortnight; replanted and put in a cool frame they will be fit for planting out doors in about six weeks. Any good garden soil, not too stiff, will be sufficient, and a good free to the sun exposed place will suit them. In the winter a thin cover of leaves or fir needle will be of use.

BEGONIA DAVISII.

A new bulbous species from Peru, the light green leaves form a dwarf rosette, from which many scarlet flower stems arise, crowned with vermilion red flowers.

PROPAGATING OLEANDERS.

I find in propagating the Oleander, or *Nerium*, if the slip is taken off with a heel or just below a joint and then split through, upwards about half an inch, the loss will not be five per cent., if given proper attention and bottom heat. J. H. C.

CORRESPONDENCE

[We solicit the privilege of publishing extracts from correspondence, of interest to the general reader. Correspondence upon Botanical subjects respectfully solicited.]

HAARLEM, HOLLAND, May 20th, 1880.

L. B. CASE, ESQ., Richmond, Ind.—*Dear Sir:* The general state of Bulbs is satisfactory; the Hyacinths look well, and if the rain we have had since yesterday only continues for a day or two and is followed by mild weather, we may expect a good crop; we suppose also the flower will be very beautiful next winter. Tulips will be very good; but the stock of some of the common varieties has somewhat diminished. but more worthy varieties are much lower in price. Crocus, Crown Imperials, Narcissus, Lilies, Lily of the Valley, etc., promise very well.

Recommending myself in your esteemed favor, I remain, dear sir,

Yours very obediently,
J. J. VAN LOGHEM.

HAARLEM, May 22d, 1880.

MR. L. B. CASE—*Dear Sir:* In reply of your favor of April 14th, 1880, I have the pleasure to send you communication in regard to the expectations we have for our Dutch Bulbs.

Hyacinths will generally be better than in the last three years, especially the pure white ones. We only want some rain at present. The prices of this article is generally high because the stock suffered last year, and well grown sound bulbs are not abundant, so I would advise parties interested to order early.

The Tulips suffered by the sharp frost last winter, but the stock is so large that I do not think it will effect the prices any. Crocus will not be as good as usual, and not so abundant. The other sorts of Bulbs generally grow later, so I dare not tell you anything about them with security, but my opinion is that they will be good.

At present I am very busy, and in a few days I shall go to England, where I shall remain some weeks. Later in the season I hope to send you something about the Bulbs for your BOTANICAL INDEX.

With best wishes. Yours Very Truly,
C. E. VAN GOOR.

MOUNT VICTORY, O., April 9th, 1880.

Mr. Case—A few years ago I gave you an account of a double spathed Calla. I took pains to fertilize the blossoms with the pollen of *Richardia Maculata*, and planted the seeds, from which I got about a dozen plants, about half of them blooming last summer. Among them was one that was very remarkable. it having two spathes, the lowest one was *eight and a half* inches in length, being pure white, except a little at the tip. The other spathe was of the usual form and size. All of the seedlings had spotted leaves. Is not this a little curious? I have planted the seed of this in order to see what it will produce next time. It was also fertilized with *Richardia maculata.*
W. C. HAMPTON.

CARTHAGE, MO., May 3, 1880.

MR. L. B. CASE—*Dear Sir:* Yours at hand. * * * * * I was much pleased with your article on the Berberry, and the fine illustration, but think you underestimate its value for culinary purposes, and the virtues of the jellies, jams, &c., made from it, in sickness, and said to be especially good in putrid fevers, &c. I have an idea that the Berberry will be a valuable substitute for the Currant with us and further South, as it succeeds well, while the Currant fails entirely, in our hot, dry autumns.

I am also glad to see the fruit bearing Japan Quince brought into notice. The plant is so much more hardy and tenacious of life, and so much more fruitful than the common Quince, that it should be widely grown, if the fruit will answer for similar purposes. But the fruit, as I have seen it, is more than double the size of your figure. Very Truly, JNO. C. TEAS.

Baron von Mueller writes under date of March 18th: "Why do you not (in America) plant *Eucalyptus Millionfold* to subdue yellow fever? You ought to raise our quick growing *Acacias* in large masses. They grow twice as quick as the best oaks, and give three times as much tannin." (There is no doubt that we in America are not making the progress in introducing many of the most desirable trees and plants for economic purposes, that some of the newly settled portions of the world are doing; but there is only a small portion of our country where the climate would warrant an extensive effort at cultivation of many of the most desirable things. It must be borne in mind that the climate on our Atlantic coast is always several degrees colder than that of Europe on the same parallel of latitude, caused by the gulf stream flowing north,—i.e., from the equator, past Europe, but south, or from the Arctic region, past eastern North America. There is quite an interest, however, in *Eucalyptus* planting in our Southern States and California, and as time demonstrates the sanitary benefits derived from these trees, no doubt they will be more generally planted. The city of Memphis, which has suffered more severely than any other from yellow fever, is probably too far north for *Eucalyptus* to survive an ordinary winter, while the occasional severe winters would be very sure to destroy them.)

ELECTRICITY AND HORTICULTURE.

Dr. Siemens has just read before the Society of Telegraph Engineers in London a paper on the recent applications of the dynamo-electric current to metallurgy, horticulture, and the transmission of power, in which he gives the latest results of his investigations and experiments on this subject. He described an electric furnace which he says is more economical than the ordinary air furnace, and which, so far as economy of fuel is concerned, is nearly equal to the regenerative gas furnace. Besides other advantages claimed for it, it is capable of an almost unlimited degree of heat. Successful experiments with the apparatus made by the lecturer in the presence of the critical audience were "hailed with ringing cheers." Dr. Siemens' latest investigations confirm the announcement made some time ago concerning the value of the electric light in horticulture. He has reached the conclusion that electric light produces the coloring matter chlorophyl in the leaves of plants, helps growth, counteracts the effects of night frosts, and advances the setting and ripening of fruit in the open air. Not only do plants need rest during the twenty-four hours but their growth may be materially advanced by exposure to sunlight during the day and to electric light during the night. At least, this is the result of experiments carried on during certain short periods. And this conclusion is in harmony with what Dr. Shubeler found in Norway, namely, that in the prolonged daylight of northern summers plants produce more brilliant flowers and larger and more aromatic fruit than are seen in more southerly countries where the lightness of day and darkness of night are about equal in duration. Dr. Siemens having found that plants under the influence of electric light can stand additional heat, expresses the opinion that forcing can be grown without immediate solar help. Dr. Siemens has made extensive preparations for experimenting on a working scale at his farm next winter. Among other questions which he wishes to determine is which part of the rays constituting white light produces chlorophyl, starch and woody fibre, and which part causes the fruit to ripen.—*Exchange.*

PARAFFIN OIL AND MEALY BUG.

I have used this oil for these last three years with the most satisfactory results, and would much rather have it than any other insecticide. Two years ago mealy bug attacked our Vines, and the ensuing winter I brushed, with an ordinary painter's brush, the canes over with a mixture of this oil and water before I gave them the usual painting. No harm whatever was done to the eyes, and the insects were exterminated. Whenever I see a bug I apply the brush, which seems to act like magic. I use the oil generally for all plants (except soft Ferns or such like), taking care of any soft shoots and leaves which may happen to be on the plant, and in consequence I am able to keep any plants which I have freer from insects, with much less trouble and expense, than heretofore; for, as "T. B." rightly says (p. 353), the various insecticides used hitherto become somewhat costly when they have to be bought in quantity, and they likewise require more time to make them up for use. I would recommend it, as I have already done, to all who are troubled with that worst of pests—mealy bug. Thrips and aphides can be easily overcome by means of fumigation, but for mealy bug and scale a touch with the brush dipped in a proper mixture of paraffin oil and water at once becomes their deadly enemy and the gardener's friend.—S. K. in *The Garden.*

Strathroy, Canada, April, 1880.

L. B. Case—*Sir:* I again send you a drawing, which you will find enclosed in this letter of a bloom, which I have in my greenhouse, on a plant of the Covent Garden variety of Fuchsia, Fig. 209. I send you this drawing thinking, perhaps, that it may be of some interest in showing a freak of nature in giving the Fuchsia a well defined calyx, or an extra set of lobes attached to the base of the tube. They are pure white as the ordinary lobes, and the tip but very slightly tinged green.

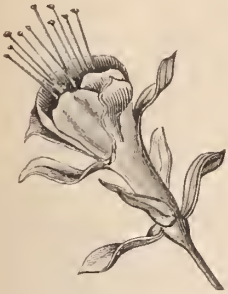

Fig. 209. *Fuchsia, Cook.*

I had last season another freak in the Geranium *Jealousy*, the growth entwining through the truss and producing another bloom, and maturing seed, from which I have raised a plant, but which has not yet produced its flowers. I neglected to make a drawing at the time, and so have lost it, and of course could not send it to you.

The drawing enclosed, you are at liberty to keep if of any interest to you, and with many regards for past favors, I remain, Yours Truly,

JAMES H. COOK.

In response to our request for information regarding the number of Botanists and Plant Collectors in different parts of the world, Mr. W. R. Guilfoyle, F. L. S., Director of the Botanical Gardens, Melbourne, Australia, contributes 22 names of persons so engaged in different portions of Australia, New Zealand, Tasmania, Fiji Islands. Mr. Guilfoyle also places us under lasting obligation for seed of 38 species of their native plants and trees.

In this connection we wish to renew our request of 1879, for information regarding Botanists, Plant Collectors, or even all Travelers abroad, who take an interest in noting the vegetable wonders of the world. We do not desire the address of any person in the employ of any corporation or firm, but simply the number and locality of such Collectors, but should be pleased to know who is collecting or traveling on their own account, to assist in making up Our Annual Record of Botanical Progress for the year 1880, which we propose to publish in the January number of the Botanical Index each year. We hope our commercial friends will see by past conduct that our motives are perfectly honorable and legitimate, and will willingly assist in the work.

ROSE CUTTERS.

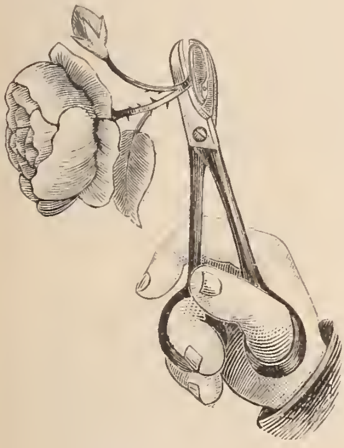

Fig. 210. *Rose Cutter.*

Among the many new inventions of value to the florist is the Rose Cutter (Fig 210) of A. A. Weeks, 82 John street, New York city. It is made on the principle of a pair of shears, but is so constructed that it holds the flower by the stem after cutting it off, until the person picking it can take hold of it. It is one of the most satisfactory arrangements for picking tender and delicate flowers, without injuring or soiling the petals, that we have ever seen.

Articles of this kind, designed to lighten the labor of the florist, and at the same time give more perfect and satisfactory results, are generally appreciated; and it is the aim of the Index to keep its readers posted in regard to all new appliances and their usefulness.

CLINTON FLOWER MARKET, NEW YORK.

From 100 to 150 wagon loads of pot flowers are emptied here every morning in the pot flower season. Callas, Geraniums, Fuchsias, Pansies, Daisies, and Polyanthus, are the most popular. From $5,000 to $6,000 per day is the estimated receipts in this market for flower sales.—*Gardner's Monthly.*

RECENT PUBLICATIONS.

[We shall be pleased to receive from authors and publishers, copies of botanical books, papers, and prospectuses, for a notice in this column.]

Since the publication of the April number of the INDEX, Robert J. Halliday's *Practical Camellia Culture* (Baltimore, Md., cloth, 141 pages 8mo., $2.00) has come to hand, and a careful perusal of its pages satisfies us that it is all we had anticipated in the way of a practical hand-book of this much-admired tree. All the suggestions and directions are plain and comprehensive, and the directions are rendered still plainer by forty-four wood cut illustrations, while five colored lithograph plates give us the forms and colors of as many choice forms of flowers. We have attempted to grow camellias for a long time, but each year they have *grown shorter* and proved most unsatisfactory. Now we feel encouraged to try again. Our Southern friends will also learn that they are their most valuable *ornamental trees*, by growing them in a cool and shady situation. We are also informed by Mr. Halliday that this work will be followed in a few months by *Practical Azalia Culture* (R. J. Halliday; ready about October 1, 1880), which will be hailed with equal delight by all lovers of these beautiful winter-flowering shrubs. We heartily congratulate Mr. Halliday in his successful and satisfactory new undertaking.

Specialists in any line of study will be pleased to know that Eugene A. Rau and A. B. Harvey have issued their *Catalogue of North American Musci*, which will be of great assistance to students in these low and simple vegetable forms. The subject is pronounced by all to have been most thoroughly handled, and includes all the authentic known species found from the Atlantic to the Pacific oceans, and from Mexico to the Arctic ocean.

From the Province of Ontario, Canada, we have a new botanical text book, of great value to botanists, collectors, as well as students, in the *Elements of Structural Botany*, with special reference to the study of Canadian plants, by Prof. John Macoun and H. B. Spotton. It will add another link to our knowledge of the still incomplete Flora of North America, which we hope some of our numerous, capable botanical authors will publish during the present decade. It is especially valuable for its local information of the botany of Western Canada (Province of Ontario), which so nearly corresponds with New York and Michigan. The work is well and accurately illustrated by drawings from the authors, while the text is carefully and admirably written.

While we are writing of local flora we would say that Prof. Volney Rattan has just issued a second edition of his *Popular Flora of California*. The work is revised and enlarged, but there is much of great interest still unknown in that wonderful country which will be an incentive for Mr. Rattan to labor on to attempt a point of completeness seldom attained by students.

Again from far-off Australia comes another valuable publication, from R. Schomburgk, Dr. Phil., in the form of a Yearly Report of *Progress and Condition of the Government Plantations and Botanic Garden* (Adelaide, South Australia, 1879). In looking through the pages we are pleased to note the names of several practical American (United States) agriculturists and horticulturists. It is the endeavor of the government botanists in all the English colonies to introduce whatever will be of most practical value to the inhabitants, and it must be a matter of great satisfaction to know that those in charge of the different Australian colonies are so eminently successful.

The Wild Flowers of America (S. E. Cassino, 299 Washington Street, Boston, Mass.) has now been reduced in price from $5.00 per part to $1.50 each, which, considering the great value of the work and the heavy cost of publishing and lithographing, is extremely low.

The American Garden has now become the property of B. K. Bliss & Sons, and with Dr. Hexamer for its editor will appear quarterly, as before. The April number before us is well filled with valuable matter and promises well for its future existence.

In the May number of the *Bulletin* of the Torry Botanical Club, George Davenport describes a new fern (*Notholæna Grayi*) from Arizona, with a most excellent plate.

Revision of the Genus Pinus, and description of Pinus Elliottii, by Dr. George Engelmann.—This is a folio pamphlet of about 30 pages, and contains three fine plates drawn on stone by Mr. Paulus Roetter. The author has taken hold of a perplexing genus, and with his usual patience and success, has worked it through, presenting us in this Revision the results of years of investigation. A full description is given of the structure of stem, leaves, and flowers the genus, and then follows a new arrangement of the species with notes upon such as the author himself has examined. The genus Pinus contains between 60 and 70 species, of which the author enumerates 45 as having been examined by himself. Two new species are described, *P. Wrightii* and *P. Elliottii*, the former being a Cuban pine, the latter growing along our southeastern coast from South Carolina to Florida, and thence westward along the gulf border, and bearing the reputation of being by far the handsomest of all the southern pines.—*Botanical Gazette.*

Notes on the Bartram Oak, by Isaac C. Martindale.—This is a pamphlet of 24 pages gives the whole history of this much doubted species, collecting from various botanical works all the facts concerning it, many of which are very interesting. The object is to give sufficient testimony for its re-establishment to specific rank under the name of *Q. heterophylla*, Mx.—*Botanical Gazette.*

Mr. Meehan's book on the "Ferns and Flowers of the United States" is having a remarkable success, and means will shortly be taken for publishing it in this country.—*The Garden.*

BOOKS WANTED.

We lack the following enumerated four numbers of *Dr. Warder's Western Horticultural Review* to complete the first three volumes, viz: Vol. III, No. 8 (May, 1853); No. 10 (July, 1853); No. 11 (August, 1853); and No. 12 (September, 1853). Any one having the desired numbers, as also all or a part of the subsequent volumes, and willing to part with them, will confer a favor by notifying us by letter, giving price of same. Of course we do not want anything imperfect, but would not object to the pages being soiled from use, or if the covers are mutilated; but the pages of reading matter must be in good *readable* condition.

We have also nearly a complete set of the *Horticulturist* from 1860 to 1874 inclusive (unbound), and the *Gardener's Monthly* from 1860 to 1874 inclusive (unbound), which we desire to complete and have bound for reference. We shall esteem it a great favor if any of our friends having any of the desired numbers would notify us.

We have between eighty and ninety duplicate numbers of the *Gardener's Monthly*, issued from January, 1871 to 1878, which we should be pleased to exchange or sell at a very low figure to any one wishing to complete a set.

We have several duplicate numbers of the *American Naturalist* which we will also exchange for any of the above desired numbers.

HORTICULTURAL SOCIETIES.

AMERICAN ASSOCIATION OF NURSERYMEN.

THE Fifth Annual Meeting of the American Association of Nurserymen, Florists, Seedsmen and kindred interests was held at Chicago, Ills., June 16, 17 and 18, 1880, with a long list of interested representatives from all parts of the country. Not only was the list of delegates a formidable one, but it also included representatives of most of the leading firms in all branches of business pertaining to Horticulture, and what is of particular moment on such occasions, nearly all of the most practical and successful members presented carefully prepared papers on their observation and experience with trees, shrubs or plants, their hardiness, adaptation to different soils, climates, and economic value; on fruit, their worth and comparative merit, their desirability and profit, and last, but not least, on birds and insects. All these were carefully considered as only intelligent and painsaking observers are capable of doing, and certainly added much to the storehouse of knowledge already accumulated. The President, T. S. Hubbard, of Fredonia, N. Y., called the first day's session to order at 10 a. m., June 16th, in the Director's Room of the Exposition building, where the usual addresses were delivered and the Annual Committee Reports were read and disposed of, while other Committees were organized for the ensuing year, after which the session adjourned to meet in Club Room No. 4, Grand Pacific Hotel, where the future sessions were held. The morning session of the second day found an increased interest in the proceedings, also an increased number in attendance Among the papers presented were:

The Influence of Phylloxera on American Grape Vines—Isador Bush, St. Louis, Missouri.

Humbugs in Horticulture—Peter Henderson, New York.

Tree Peddlers—Prof. Geo. Husman, Columbia, Missouri.

Protection of Trees from the Sun—Charles D. Zimmerman, Buffalo, New York.

The Duties of Nurserymen in Propagating Varieties—Suel Foster, Muscatine, Iowa.

The following officers were elected for 1880-1: President, N. H. Albaugh, Tadmore, Ohio; First Vice President, G. B. Brackett, Denmark, Iowa; Secretary, D. W. Scott, Galena, Illinois; Treasurer, A. R. Whitney, Franklin Grove, Illinois. Dayton, Ohio, was selected as the place for the next meeting, and the third Wednesday in June, 1881, the date. The day was spent very profitably to all the members, and the following one was devoted to an excursion to the parks and other places of interest, after which the Association adjourned *sine die.*

THE MISSISSIPPI VALLEY HORTICULTURAL SOCIETY.

At the late meeting of the Missouri State Horticultural Society, at which delegates from several States were present, it was resolved to take steps looking forward to the organization of such a Society as is named above, and a Committee was appointed to arrange preliminaries, and to invite the Horticulturists to meet in convention, when, by their united counsels, most liberal things may be devised and executed.

After due consultation, the gentlemen named below have decided to call a convention to meet in St. Louis, on Wednesday, the 8th day of September, next, at 9 o'clock a. m., and to continue for three days. The meeting is to be held in the large hall of the Merchants' Exchange Building, which that city claims to be "the finest hall in America." It is assuredly large and fine enough for the purpose, and, with the extraordinary backing which this new enterprise has, it cannot fail to be a mammoth affair, and fruit-growers everywhere in the West will be glad to learn of this thing. We find considerable enthusiasm already in that city in view of this forthcoming exhibition of fruits, plants and flowers. The following are the gentlemen, prominent in Horticultural circles, many of them officers of State Associations, who have signed the call for the convention:

Norman J. Coleman, J. C. Evans, S. M. Tracy, Missouri; S. H. Nowlin, C. C. Smith, J. B. Hoag, Arkansas; Parker Earle, O. B. Galusha, J. E. Starr, Illinois; T. V. Munson, H. Tone, Texas; W. H. Ragan, Indiana; T. J. Lyon, C. W. Garfield, Michigan; J. M. Smith, Wisconsin; C. L. Watrous, J. L. Budd, Iowa; M. W. Phillips, Mississippi; R. W. Furnas, D. H. Wheeler, Nebraska; J. M. Morton, Tennessee; E. E. Gale, Kansas; J. T. Grimes, Minnesota; H. W. L. Lewis, Louisiana.

The purpose of this organization is to serve the interests of Pomology, Forestry, and Floriculture, and thus serve the interests of the people generally, without regard to locality. The Premium List is a most important item, and we give it here in full. The amount of premiums to be given is $2,500,—and who will say they are not liberal?

Mr. Parker Earle, of Cobden, President of the Illinois State Horticultural Society, is the Chairman of the Executive Committee of this new organization, and Mr. S. M. Tracey, of St. Louis, Secretary of the Missouri State Horticultural Society, is the Secretary of this Society. Further information on the subject will be given by the Secretary, by addressing 600 Olive street, St. Louis, Mo.

MASSACHUSETTS HORTICULTURAL SOCIETY.

The Massachusetts Horticultural Society have recently issued in a neat little 32-page pamphlet their Schedule of Prizes for their Exhibitions for 1880, which consist of an Azalia and Rose exhibition March 18; Pelargonium exhibition May 8; Rhododendrons, June 15; Roses, June 22; Strawberries, June 28; an annual exhibition of Fruit, Flowers and Vegetables, September 14 to 17; Autumn Fruit, October 2; Apples, Pears, Chrysanthemums and other flowers, November 10. The prizes to be given at these exhibitions are $3,050 in cash, while $75 is also appropriated for the best essay (subject for discussion to be furnished by the Society).

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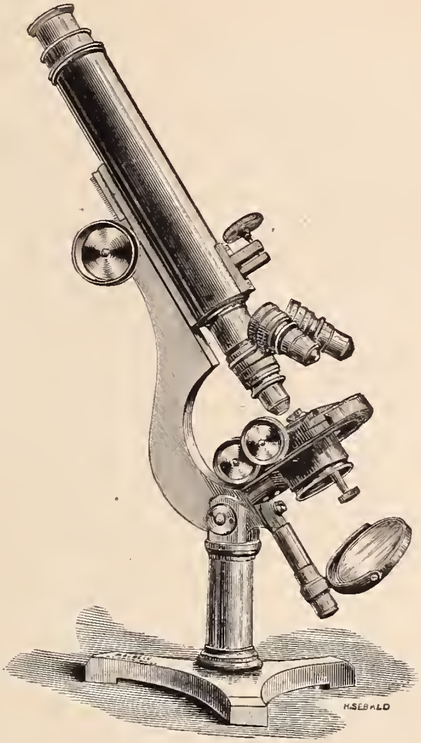

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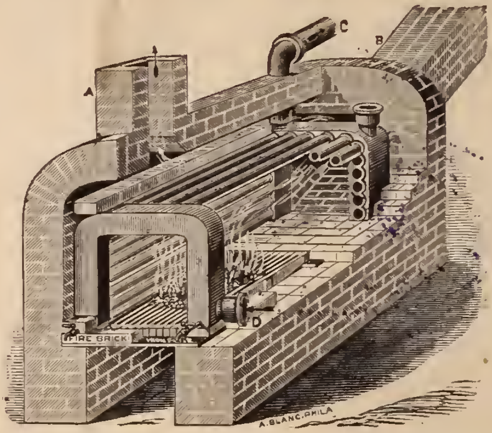

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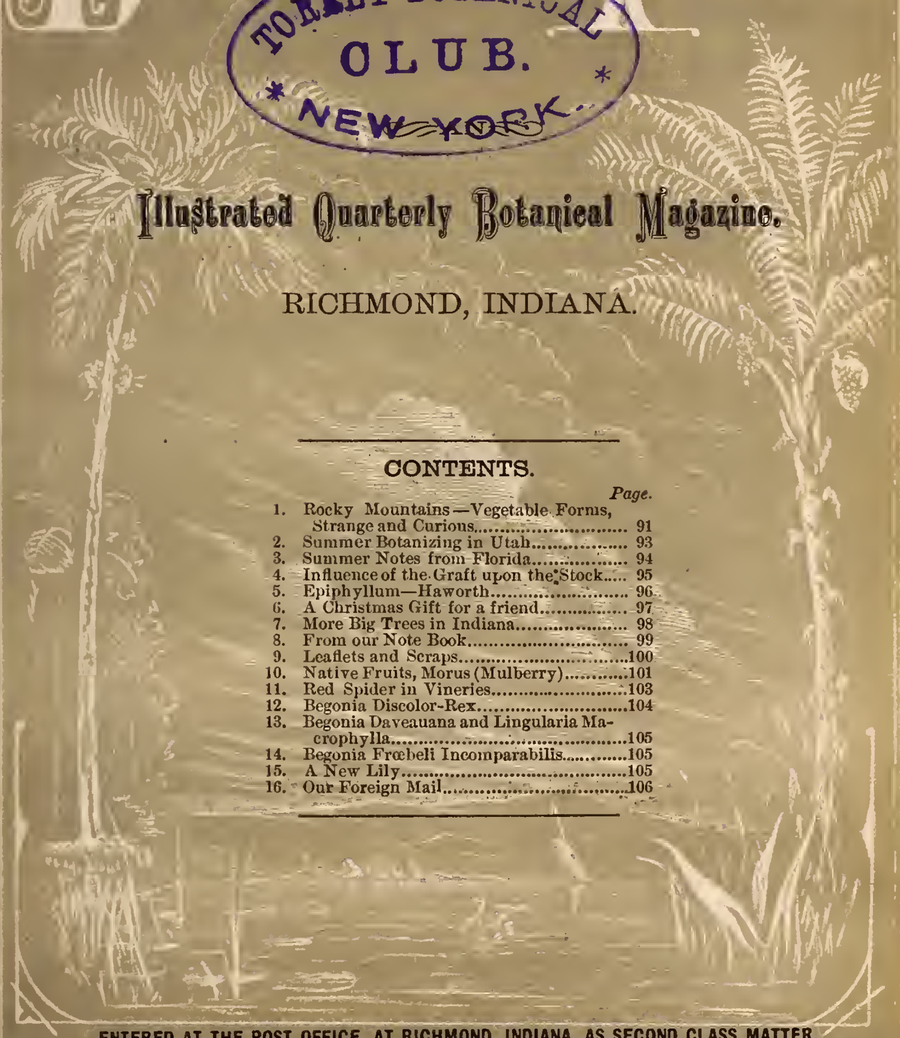

Illustrated Quarterly Botanical Magazine.

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BOTANICAL INDEX

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SEPT. 9TH
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Territorial Seal of Utah.

ROCKY MOUNTAINS.

VEGETABLE FORMS, STRANGE AND CURIOUS.

BY J. E. JOHNSON, ST. GEORGE, UTAH.

NATURE is consistent, bountiful, and honest, and as a rule very impartial. Her gifts are seldom collective, or all lavished upon any one section of the universe, but are widespread. The wooded and prairie countries possess many advantages and beauties, and the valleys, mountains and deserts too are not left in sadness and destitute, but has much to sustain life,—to command admiration, and from which to found fortunes. Our valleys offer rich soils for horticulture; our mountains yield minerals, metals and chemicals in nearly every known variety, as well as choice timber, flowers delightful and fragrant, nuts, fruits, marble and precious stones, and even the arid plains and deserts produce a new world of the strange, the useful and lovely, and altogether they are a study of the grandest magnificence beyond the power of pen to paint. A person passing over our deserts is impressed with the utter desolation around, the vast distance, the burning sand, absence of moisture, the thorny, leafless cactus, agaves, yuccas, and starveling, stinted shrubs. It would seem to the unpracticed mind that were a person lost upon these desert plains, a rescue from death would be hopeless; and yet these ugly cactus are composed of three-fourths water, the sere shrubs bear a delicious berry, the Spiny Yucca bears an edible fruit resembling a banana. The cactus in various forms produce a fruit often delicious: the agave bulb, when properly roasted, gives a sugary, nutritious food; many herbs produce foliage that is edible and good, either raw or cooked; insignificant weeds and grasses bear nutritious seeds and bulbous roots, good for food. The *Calochortus Californica* (Indian name, Sego), produces a lovely flower, and its bulb in one of the greatest vegetable delicacies. Thousands have been saved from death upon these cactus deserts, by these wonderful provisions of nature given to a region *apparently* destitute of all earth's blessings.

The *Cereus Gigantea* is one of nature's grandest accomplishments in botany. They often rear their heads twenty or thirty feet, straight or with projecting arms like a mighty giant, guarding the treasures of the lone desert, or the passes in the mountains. The *Yucca Brevifolia* or *Needle Palm*, is another magnificent specimen in botany, rising from ten to twenty feet, often with umbrageous head, and the numerous limbs giving terminal masses of cream-colored bloom, sometimes weighing 15 to 20 pounds; the seed formed in a dry capsule, fruit size of a peach. "This fruit, in northern Mexico and Arizona, is called sotol, and is used quite extensively as an article of food." The tree-like body of the plant, which is often 20 to 24 inches in diameter, and is composed of a thin, gauzy network of tough filament, valuable as a paper material. The tree and branches are covered with a rough and ragged coat of persistent, recurved and imbricated remains of former leaves, giving the tree an exceedingly ugly appearance, especially when growing in immense forests on the desert plateaus, with very little other vegetation near them. "The trunks have been used in Mexico as palisades in the construction of stockades." [Dr. Engelmann in Mexican Boundary Survey.]

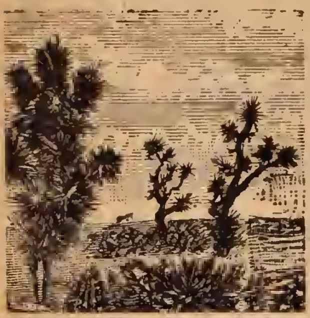
FIG. 212. *Yucca Grove in Southern Utah.*

Another very interesting species is *Yucca angustifolia*, the true *Spanish Bayonet* of frontiersmen, which takes the place, in general form and appearance at least, west of the Mississippi river, of your common eastern species, *Yucca filimentosa*, which is found from the Mississippi river east, usually in such poor ground. One form, we are told by Dr. Engelman, has a large geographical range, reaching from Southern Utah to Central America, and it also assumes quite a variety of forms, but he says "they are always easily recognized by their never constricted obtuse capsules (fruit), and the large broad-margined seed, nearly one-fourth of an inch broad. The true *Yucca angustifolia* is a low-growing or stemless species with leaves from 12 to 15 inches long and from 1½ to 2½ inches wide, all growing from a common center, and pointing every conceivable direction, so as to form a pyramid that bids defiance to man or beast. We have a dwarf variety found near here and said to be peculiar to this locality, that has leaves only about 2 lines, or about 2-6 of an inch wide. Two other varieties of *Yucca angustifolia*, which Dr. Engelmann has named *Var. Elata*, from Arizona, grows several feet high, and *Var. Radiosa*, also grows several feet high. The leaves are linear, stiff, and ends with a sharp pointed spine. Along the margin of each leaf is a narrow white line, and like your eastern species also there are fine thread-like fibers from 2 to 2½ inches long, constantly separating from the leaf and hanging to the margin by one end. The flowers are a greenish white and produced on stems about 4 or 5 feet high, while the fleshy edible fruit is often 3 inches long and ½ an inch across. The leaves are thick, stout, about 3½ inches long and ½ an inch broad, and not narrowed above the base as in most other species, but gradually narrowing down to a sharp spike-like point. It is margined its entire length with sharp serrated edges, and are thickly set in a crowded bunch at the ends of the branches. They are also fibrous and from the edges are a few thread-like filiaments hanging, the whole of which is also a valuable paper material.

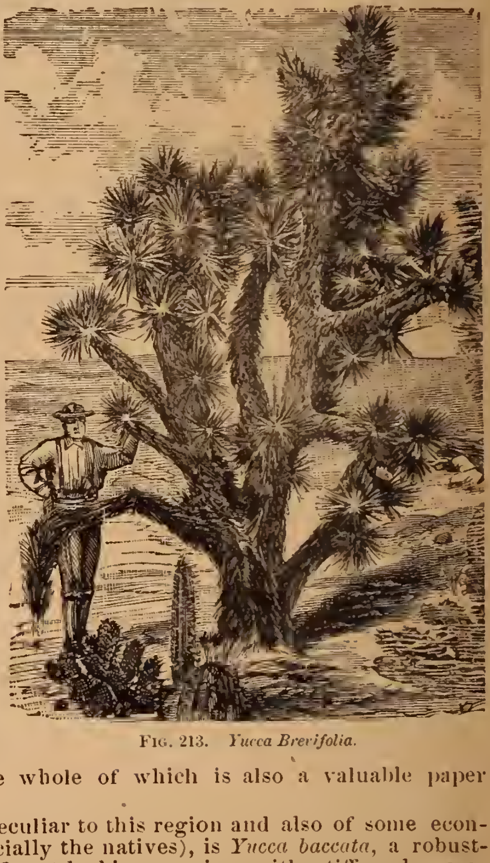
FIG. 213. *Yucca Brevifolia.*

Among the other species of *Yucca* peculiar to this region and also of some economic value to the residents (more especially the natives), is *Yucca baccata*, a robust-growing, stemless, yet rather insignificant-looking species, with stiff and coarse leaves nearly 3 feet long and 2 inches wide, also margined with a few coarse threads or filaments and terminated with a sharp spine. The flowers are the largest of all the Yuccas, being nearly 5 inches across, and are produced in a large panicle, while the succeeding fruit hangs in a large cluster, somewhat resembling the banana. This fruit is also the most important article of food furnished by any member of this interesting family of plants.

Yucca Whipplei is also occasionally met with near here, which is quite an interesting if not an attractive species. It is also a stemless variety with few striated glaucous leaves channelled on the upper side, rounded or obtusely angular underneath, slightly serrate-scabrous on the margins, about 18 inches long and half an inch wide, convolute and spiniferous at the apex, fruit coronaceous, three-lobed, 1¼ inches long, and nearly the same across, flowers in a spreading panicle on a stem from 2 to 3 feet high.

The bruised root of all the *Yuccas* were formerly used very extensively by all the natives, at least on the Pacific coast, for making a soap-suds in washing, and at the present time it is not an uncommon sight to see the semi-civilized Indian and her Mexican half sister still using this vegetable soap—which they call "Amole"—in the Mexican villages, even as far north as Utah. It certainly possesses the economic advantage of always being handy and ready for use, on the desert plateaus of the West, while if these miserable and indolent people were to depend upon their own exertions for making their supply in the ordinary mode of making soap, there would probably be very little soap used by them.

Like the cactus the yucca family are so formed by nature, when there is moisture the plant absorbs or takes up a good stock, which the cuticle holds from evaporation under the scorching heat of the summer sun.

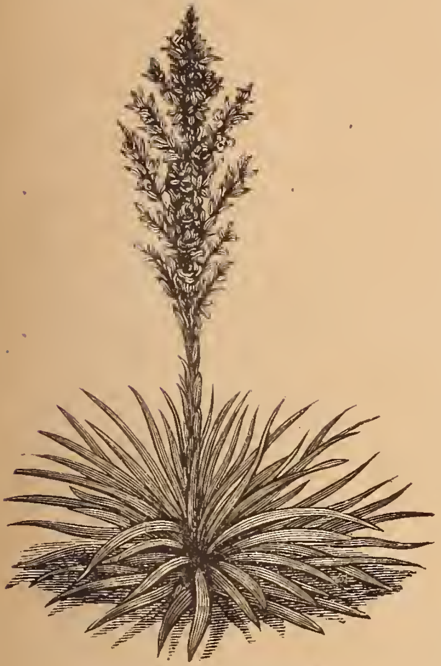
FIG. 214. *Yucca Angustifolia.*

SUMMER BOTANIZING IN UTAH.

BY MARCUS E. JONES, SALT LAKE CITY, UTAH.

[The following summary of Prof. Jones's summer's work, is so very interesting that we have taken the liberty of making an extract from his private letter for the benefit of the readers of the Index. In doing so we would say, that his collection for the past few years have been among the most valuable contributions to many of the choicest herbariums, both in Europe and America, of any from Colorado, Wyoming and Utah, while his observations and investigations in this field of study are eagerly sought for by botanists in all countries. We are promised additional contributions from his pen as soon as time will permit, which we hope will be ready for the January number.—ED. BOT. IND.]

MY work began by a trip through the snow, 350 miles south of here, in March. I arrived in St. George about April 1st, where I collected for a month, and found very many valuable plants and a few new species, (finding some 200 species.) These plants of South Utah have always been greedily sought for, for it is seldom that a botanist is willing to take a team and drive 350 miles into such a country to secure plants; for the hardships are very great. On the way back, in May, I found several new species as well as others of value. I reached the City on May 10th, and spent most of the season in exploring the Wasatch and Oquirrah mountains. In June I went to Frisco, nearly on the border of Utah (west), 100 miles north of St. George, where no other botanist had been. There I found many very interesting plants and perhaps 6 new species. I consider the work done there the most valuable of any done during the season. The work of the season numbers about 1000 species, and nearly 20 new species. I collected 40,000 specimens. I have been collecting for three years in the

West gathering 2,500 species and 75,000 specimens. I shall collect in Southwestern Utah, California and Arizona, next season. Mr. Toronto of this City, and Mr. Howard, two young collectors, have done good work here and deserve mention.

I cannot fail to mention a very pleasant visit I had with Drs. Engelmann and C. C. Parry, who came here in July and stayed nearly a week. We went over the mountains together and found some valuable things about the conifers of this region. Do not fail to give a full report of this extended trip along with Prof. Sargent of the Harvard Arboritum. They went as far as the Fraser river in Oregon, and as far south as Tucson, Arizona, and cleared up many doubts on the conifers of the West. Lemmon has been making some very good collections in Arizona.

SUMMER NOTES FROM FLORIDA.

MARY C. REYNOLDS.

WHILE engaged during the past season in collecting plants, I have been very much interested in noting the great variety in the forms of roots. Many of our plants have thick carrot-like roots, extending far below the surface, and possessing few or no fibrous roots. *Asimina grandiflora*, a small shrub of the Papaw tribe, which bears large drooping white flowers, has one large straight tap-root which extends downward four or five feet. It is extremely difficult to dig small plants, and the difficulty increases to impossibility with large-sized ones. As yet I have been unable to procure any of the sweetish fruit, as the hogs are very fond of it, and take early possession. *Acerates connirens*, a pretty member of the milkweed family, has also a very thick and rather woody tap-root which is sometimes an inch in diameter. *Berlandiera tomentosa*, with its honey-scented bright-yellow flowers, *Stillingia sylvatica*, (the milky "Queen's-delight") and *Ceanothus Americanus*, with its dainty tiny white flowers, have all roots of the same character.

Of the *Rhexias*, with their gay beautiful flowers, we have five or six species. The "Deer-grass," as *R. glabella* is especially called by the country people here, because of the fondness of the deer for its leaves, has two or three rather thick, long, perpendicular roots which have a distinct soft bark easily scraped off in digging. *R. ciliosa* and *R. Mariana* on the contrary have two slender horizontal fibrous roots spreading quite near the surface. *R. lutea* is a beautiful yellow-flowered species.

The three *Pinguiculas*, *P. pumila*, *P. elatior* and *P. lutea* (one of our very handsomest wild flowers), have a cluster of straight succulent white stools two or three inches in length. These Pinguiculas are very attractive house-plants, both on account of their pretty clusters of pale yellowish-green leaves and their beautiful flowers. With us they bloom in March and April.

Liatris odoratissima, the "Florida Vanilla," and *L. Paniculata* have their fleshy fibrous roots, while *Liatris elegans*, in common with several other species, has a root like a small round turnip. A fit companion for their handsome composite flowers is the beautiful pale-purple *Carphephorus corymbosus*. It is noticeable in this study of roots that those plants which have very thick fleshy roots are usually natives of dry sandy barrens; and others of damp places.

Canna flaccida is a native of our bogs; its bright yellow flowers are very different in shape and size from those of the garden varieties, resembling very much the Iris blossoms. It is very beautiful and well worthy of cultivation, which it enjoys.

Among the native vines there are two which deserve especial mention, *Clitoria Mariana* and *Centrosema Virginiana*. The first is already known. The Centrosema is a delicate vine bearing a profusion of elegant purple flowers, and is a free grower.

Among the Orchids collected this year are the rare *Mycrostylis Floridana*, Chapm. (for which I have discovered two new localities), *Epidendrum venosum*, and *E. conopseum: Bletia verecunda*, *Pogonia divaricata*, *Gymnadenia flava* and *G. nivea; Platanthera ciliaris* and *var blephariglottis*, *P. cristata*, *Goodyera quercicola* and *Ponthieva glandulosa*. The two latter and the Epidendrums are excellent for fernery culture.

Duranta Plumieri and *Chiococca racemosa* are noteworthy because of their beautiful berries. The *Duranta* is a tall, elegant shrub bearing loosely-flowered racemes of small lilac-colored flowers succeeded by golden-yellow berries about as large as currants; these racemes are from four to eight inches long, and the wax-like berries are very handsome.

The Chiococca is a shrub or shrubby vine with small while flowers and racemes of snow-white berries. These are very elegant as shown against the glossy dark green leaves.

My experiments in fern culture prove that *Polypodium Phyllitidis*, *P. aureum*, *P.*

pectinatum, *Acrostichum aureum*, *Aspidium patens*, *A. Floridanum*, *Asplenium firmum*, *A. myriophyllum*, *Blechnum serrulatum* and *Adiantum tenerum* bear cultivation well, and form a very pleasing and varied collection. Some of these grow on trees, some on the ground, and some hide away in limestone caves or "sinks" in the ground. *Polypodium plumula* and *P. incanum* often grow on high branches of lofty live-oak trees in deep forests, and I have seen them waving from the huge limbs forty to fifty feet above the ground, where they were entirely inaccessible.

INFLUENCE OF THE GRAFT UPON THE STOCK.

L. S. MOTE, WEST MILTON, OHIO.

IN writing a few words on the subject of Grafting, it is not my purpose to open up a discussion on that old mooted question of *stock influence*, but simply to note a little what has come under my own obervation, more especially, that of *graft influence* on the stock. Perhaps no one who has had much experience in this line of business will attempt a denial of the existence of such a fact. In stock influence, I observe if we take a scion of the Yellow Belleflower apple, for instance, and insert it in a sweet apple stock when it produces fruit it will be a Yellow Belleflower in size, shape and coloring (perhaps), but its acidity will be much modified by the stock's saccharine juices. I have noticed too that some varieties were much improved in size and external appearance by being set on other stocks than the original native ones; and further, that many a nice nursery tree died a premature death by being grafted on a weakly, sickly stock. We find something of a similar character in rose grafting. My friend E. G. Hill, recent foreman of Cascade Gardens in Richmond, Ind., showed me some of his experiments with the Abutilon, by grafting some of the plain-leaved varieties on Thompsonii stocks; the leaves of the scion become nearly as much variegated as that of the stock. But now, on the other hand, does the graft have any influence on the stock? My opinion is that there is more of it than a casual observer would discover. Those who have cultivated fruit trees to any extent know what a vast difference there is in the growth of certain varieties of apples, pears, peaches and cherries, the strong growers making double the amount of wood in a season that the weak growers do; the stocks on which the grafts or buds are inserted, being stimulated by their vigorous running sap, keeping in equal pace and size with the top growth. The wood of Quince, also, below a bud or graft of a strong growing pear, will make double the growth it does generally. Nevertheless it is reasonable to suppose that two opposite forces thus combining will produce certain modifications in each other.

A sample of graft influence *on the stock* may be seen at my house. Last summer I cut a graft off from an Abutilon Thomsonii, and inserted it on a branch of a plain leaved variety over three feet in height (from the root.) The pot was plunged in the border. The graft grew through summer rather slowly and was not much noticed; but passing it one day in September I discovered lateral shoots up and down the stock, and all, underneath the graft, were nearly as much variegated in leaf as the graft, whilst those on the opposite side were simply plain ones like the branches. Those distinctions reached clear down to the base. This instance of a sportive tendency is not quite as much of an anomaly as I had supposed, for upon a little research I find in *Gardeners' Monthly* of 1866, December number, instances of this character are noted by the editor: "Mr. William Reid of Elizabeth, New Jersey, showed some Variegated Willows which he had grafted on some plain leaved ones, and the variegations were pushing out all down the sides of the stock *below* the graft." Another instance or two is mentioned: "Mr. J. Stough had grafted a Mountain Ash with scions of the Bartlett Pear, three feet above the ground. Next season a pear sprout pushed out from the Ash stock six inches *below* the graft." "He once grafted the Rose Acacia, *Robinia hispida*, on the Black Locust, *R. Pseud-acacia;* sprouts pushed out of the stock *below* the graft, similar in every respect to the graft above." Many other instances might be presented to prove that oftimes there is a manifest and to a considerable extent a controlling influence of the graft upon the stock. Will the editor be so kind as to give us his opinion in regard to those sportive lateral shoots whether there is a sufficient fixedness imparted in their constitution to remain in scions taken and propagated from, or will revert back again as soon as disconnected from this circulating influence.

[We wish some of our practical and more experienced horticulturists (than ourselves) would give their observation in this graft influence upon the stock. We will, however, attempt a few lines in the next number on our observation, which we must now say is very limited.—ED. BOT. IND.]

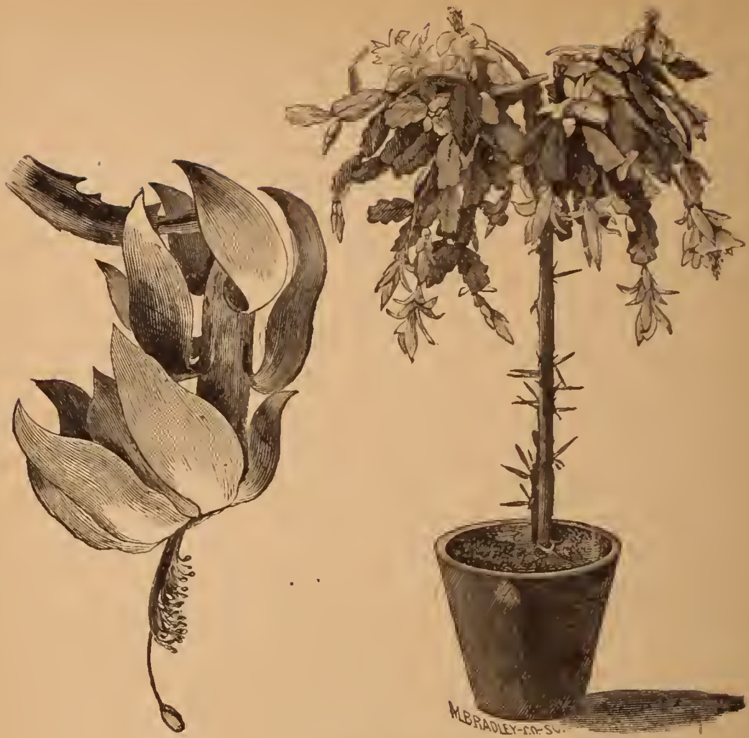
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FIG. 215. *Epiphyllum Truncatum.*

EPIPHYLLUM. HAWORTH.

SIR Joseph Paxton, in his Botanical Dictionary, says: "These splendid flowering plants are the pride of every well-furnished garden," but in America they are very seldom seen under cultivation. Why this is we cannot tell, for they certainly are among the easiest plants grown, and from their unique appearance are always attractive. In an English journal of a year ago is an account of a botanical writer's visit to a celebrated English conservatory, wherein he describes the fine effect of these plants for bordering the tables and benches in the conservatory. The manner of using them was to set plants grown on their own roots, and in small pots, on the front of the bench, and immediately back of them was a row of larger plants in 4 and 6-inch pots, grafted on stock of Pereskia about 6 inches high, which brought them well above those in front, producing a nearly solid mass of bloom. Immediately in front of where we write these lines stands one of these plants grafted on *Cereus triangularis*, about 6 inches high, which is now a floral treasure. It naturally grows about 2 or 3 feet high, but as usually seen under cultivation it is of low, spreading growth, and our plant, which is 5 years old, contains 11 separate branches, upon each one of which is now a flower or a large and perfect bud; in addition to which are 7 more newly started branches with only a single joint, but which next year will probably produce each one a flower in addition to the older branches. Unlike most other varieties of *Cacti* these flowers remain in perfection a long times, which is a consideration of importance to people whose available space for growing wintering flowering plants in the house is of necessity very limited.

The most satisiactory mode of growing the *Epiphyllum* is to graft them upon some of the tall or erect-growing *Cacti*, which is very easily and quickly done by simply splitting the top of the stock chosen for the standard an inch or two and inserting in the fissure one or two of the joints of the Epiphyllum, and holding them in place by passing a common pin, cactus thorn, or even a sharp wooden pin through both graft and stock and allowing them to remain undisturbed until the graft has firmly joined itself to the standard. We prefer putting in two grafts (side by side, in the same slit), one to grow to the right and the other to the left, as it gives the specimens a more symmetrical and graceful appearance. The grafts will probably not grow more than 4 or 5 inches above the summit of the stock, but will form a perfect circle of spreading and gracefully drooping branches, giving it an umbrella-like appearance. Perhaps the Pereskia makes the handsomest stock for grafting upon, but from its small size it is more difficult to keep the grafts in place until firmly rooted, consequently we prefer as a stock *Cereus triangularis*, *C. Peruvianus*, or some other tall growing and more fleshy variety, at least it is much more certain of success with amateurs.

As perhaps many of our readers may not be familiar with the special plant under consideration, we give at the head of this article an excellent illustration of *Epiphyllum truncatum* grafted upon *Pereskia aculeata*, which we procured from Olm Bros., New York, and as we fear our description may not be complete in itself, we will add brief extracts from the already published scientific descriptions. First, "the name is derived from two Greek words, *epi*, upon, and *phillon*, a leaf, in allusion to the flower growing from the ends of the flat leaf-like branches."—(Bot. Dic.) There is a certain mysterious strangeness associated with the very name of *Cactus*, and as we enter more fully into their study their very nature seems almost an enigma. Here we have a plant composed exclusively of short, flat, leaf-like joints, growing out from each other and resembling leaves joined by their ends, ranging from one and a half to three inches in length by about half an inch wide; each joint is smooth, glossy green, thin, flat, margins more or less notched, and pointed with a minute, soft, spine, and with a few small, weak, hair-like spines in the apex of the notches, but no true spines or prickles upon the plant. Along the center of each segment and running the entire length of the plant is a tough, woody, midrid which with age becomes cylindrical in the lower joints and assumes a solid stem-like form. They are "all natives of Brazil, particularly on the Organ mountains, but are seldom found at a greater elevation than 4,500 feet. They are generally found growing upon the trunks of trees" (Treas. of Botany), hence they seem to be particularly designed for grafting to reach perfection. When A. H. Haworth, a celebrated English succulent botanist first founded this genus, he included in it many species since removed to other genera, and all the species now known as *Phyllocactus* as well as the only three true species of *Epiphyllum* now recognized as valid. The flowers of the true *Epiphyllum* are produced singly from a deep notch, at the end of the last joint, usually during winter, are about two or three inches long, of a curious oblique form, with from 6 to 10 reflexed (in *E. truncatum*), or straight and spreading (in *E. Russellianum*), sepals and petals which are of a pink, orange, crimson or with a violet shade of color are so very similar that they can scarcely be separated, though the innermost have their bases united into a tube. The stamens are numerous, white (in *E. truncatum*) or pink (in *E. Russellianum*), and arranged in two series. The fruit is a small, very smooth berry, sometimes having angular ribs."—(Treas. of Botany.)

Although there are but three true species, there are in addition four natural varieties which almost claim rank as species, and the skillful hybridizer has produced innumerable new garden hybrids so that a complete nurseryman's list would enumerate hundreds of varieties, all of which are among the choicest winter-blooming house or conservatory plants, and should be more frequently seen under cultivation, particularly as their culture is so easy and simple. Only common garden soil with a plenty of sand is actually required for them, but a more scientific and systematic compost is composed of "sandy loam mixed with brickdust and lime rubbish and a little peat, or well-rotted cow manure and a perfect drainage."—(Paxton's Bot. Dic.) Very little water is required, but we find that they thrive best with a little more water than any other variety of cactus, especially when in bloom. They also thrive best if kept growing the year round and sheltered from the direct scorching rays of a summer's sun, especially under glass. As we have given ample directions for grafting we will only say, cuttings root readily if taken at the natural joints, and allowed to dry a day or two before planting, which can be done into small pots containing a compost of equal parts of loam and sand and given a warm growing location.

If you desire to make a Christmas present to a friend nothing would be more acceptable than a year's subscription to the BOTANICAL INDEX. It gives all the current Botanical news of each quarter; contains usually a beautiful illustrated article on some of our *Native Fruits*, also on *Water Lilies*, besides contributions from some of the best Botanists, Collectors and Horticulturists of the country. Our foreign correspondence will be found of more than ordinary interest. Only 50 cents a year.

MORE BIG TREES IN INDIANA.

M., OF INDIANAPOLIS, INDIANA.

IN the April number of the Index our friend Rev. B. W. Smith has given a very interesting notice of some of the "Big Trees of Indiana," which no doubt was a real surprise to many of your readers, especially those who have never seen the wonderful productions of that garden of the West, the Wabash valley. Now my business requires my constant attention at my office, or when temporarily called to a neighboring town or city I feel compelled to make the trip with all possible dispatch, consequently I have never had the pleasure of seeing any of these vegetable giants in all their glory, however, I read with great pleasure of the observations and investigations of others, and wishing for the advancement of our own state in this search after knowledge, I will with your consent call attention to a few objects of interest as recorded in the annual reports of the State Geological Survey. I really expected some one more familiar with the subject than myself would prepare a supplementary article for publication either in your Index or some other kindred publication, but as none appeared in the July number I fear none will be attempted in the next unless I do it, so will make the effort. Perhaps it may not be amiss in this connection to say that the Lower Wabash Valley is considered by competent judges to be the richest and most productive body of land within the limits of the United States, and challenges the world to produce such crops or even individual specimens of corn as grow here with very ordinary cultivation. Now the original forest was composed of a corresponding luxuriant growth of undergrowth, vines and timber until removed by the early settlers, which in most cases was was either ruthlessly destroyed and wasted or employed in only nominal uses, for which the supply of a less valuable timber was amply abundant. Again, the luxuriant growth and sheltered position of timber in this valley, also served as a protection to many southern forms of plants and trees which are found in no other portion of the country of equal latitude, hence, it is one of the most desirable localities in the country for studying and comparing a Northern and Southern flora in a natural condition. Of course the true southern forms would not reach the high state of perfection at their very northern limit that they would further south, but here they are found in most excellent condition, flowering and fruiting quite freely, and (if trees) reaching nearly their normal growth. But probably in no part of the country was there such an enormous quantity of such extra large and fine Black Walnut found as was here originally seen, which all agriculturists have long since learned was a sure indication of very superior land. The list, I find, reads as follows, all of which are from the lower Wabash:

Latin Name.	Common Name.	3 Feet from the Ground.	To the First Branch.	Total Height.
Acer saccharinum	Sugar Maple	12 ft. 6 in.	60 feet.	118 feet.
" *rubrum*	Red Maple	13 ft.	60 "	108 "
Carya alba	White Hickory	15 ft.	60 "	
" *olivæformis*	Pecan	16 ft.	90 "	175 "
" *tomentosa*	Black Hickory	10 ft. 4 in.	55 "	112 "
Catalpa bignonioides	Catalpa	6 ft.	48 "	101 "
Diospyros Virginiana	Persimmon	5 ft. 6 in.	80 "	115 "
Fagus ferruginea	Beach	11 ft.	10 "	122 "
Fraxinus Americana	White Ash	17 ft. 6 in.	90 "	144 "
Gleditschia tricanthos	Honey Locust	18 ft.	61 "	129 "
Juglans nigra	Black Walnut	22 ft.	74 "	155 "
Liquidambar styraciflua	Sweet Gum	17 ft.	80 "	164 "
Liroidendron tulipifera	Tulip Tree	25 ft.	91 "	190 "
Morus rubra	Red Mulberry	10 ft. 6 in.	20 "	62 "
Platanus occidentale	Sycamore	33 ft. 4 in.	68 "	176 "
Populus monilifera	Cottonwood	22 ft.	75 "	170 "
Quercus alba	White Oak	18 ft.	60 "	150 "
" *coccinea*	Scarlet Oak	20 ft. 3 in.	94 "	181 "
" " *var. tinctoria*	Black Oak	20 ft.	75 "	160 "
" *macrocarpa*	Burr Oak	22 ft.	72 "	165 "
" *palustris*	Water Oak	12 ft.	25 "	120 "
Sassafras officinale	Sassafras	7 ft. 9 in.	75 "	95 "
Tilia Americana	Basswood	17 ft. 6 in.	50 "	109 "
Taxodium distichum	Bald Cypress	18 ft. 9 in.	74 "	146 "
Vitis labrusca	Grape Vine	32 in.		150 "
Tecoma radicans	Trumpet Vine	38½ in.		
Bignonia capreolata	Cross Vine			75 "
Sicyos angulatus	Single Seed Wild Cucumber			63 "

From other parts of the State I find the following noted trees recorded, and worthy of mention:

LATIN NAME.	COMMON NAME.	LOCALITY.	3 FEET FROM THE GROUND.	TO THE FIRST BRANCH.	TOTAL HEIGHT.
Quercus alba	White Oak	Huntington County	20 ft. 3 in.		
Liriodendron tulipifera	So-called Poplar	Jackson County	38 ft.	65 feet.	120 feet.
Ulmus fulva	Red Elm		18 ft.		
Castanea vesca	Chestnut		29 ft. 6 in.		
Platanus occidentalis	Sycamore	Jefferson County	40 ft. 6 in.		
Sassafras officinale	Sassafras	Jennings County	12 ft.		
Quercus alba	White Oak	Parke County	16 ft. 10 in.		
" "	White Oak	Parke County	18 ft.		

I would like to see some of our practical and observing Horticulturists or Foresters make notes of other famous trees in the State, of which, I feel certain, there are many not yet recorded in public prints.

FROM OUR NOTE BOOK.

Among the strange forms of flowers noticed in our garden this year was a flower of a pompone Dahlia with two *perfect faces*, or a flat, erect receptable, and one set of petals facing the right and the other to the left.

A curious freak of the flower stem of the *Hemerocallis fulva plena flora*, (a double form of the old garden yellow day Lily), as seen in our garden for the past few years, is for a new branch to break out and grow from the old flowering-stem about half way between the ground and the flowers, and continue growing until the frost kills the plant down. The new branch draws its nourishment from the old plant through a small portion of the old stem, while all of the stem above, and all the stem except the narrow portion above described, is entirely dead. We have occasionally noticed this peculiarity in other varieties of Hemerocallis, but it was always an exception, while in our double-flowering variety it is always the rule.

A few years ago we received from Messrs. Baird & Tuttle two species of *Hemerocallis* labeled *H. Alba* and *H. Siberica*. *H. Alba* has a splendid spike of white flowers ers in early spring and an occasional one in fall. *H. Siberica* is very similar to *H. flava*, the old Lemon Lily, but perhaps the leaves are a little narrower. It blooms very profusely and of the same shade of canary yellow as *H. Flava*, and at the same time, but this fall (in September and October) it again came into flower, but in place of the flowers being borne on tall stems, they were produced on stems not more than 4 inches high, and usually from one and one half to two inches high, being in fact completely surrounded by the dead leaves of the plant.

During the past summer we have noticed the following plants in our grounds with variegated foliage usually produced from new growth of old plants, *Lonicera Tartarica*, *Hibiscus Syriacus* var. *Blanc Youelle*, *Spirea sorbifolia*, *Richardia Africana* (calla), *Heliotropum Peruvianum* (cultivated Heliotrope), from seed. These are now being propagated, and in due time will be offered for sale.

A visit to the magnificent conservatory of M. E. Reeves, Richmond, Indiana, reveals the fact that his splendid specimen of *Bonapartia juncea* is now in bloom. The flowering stock is about 17 feet high and evidently has not yet reached its full height. Although each flower is not conspicuous nor brilliant, it is such a rare and curious sight to see one of these choice Bromelioids in bloom that it is well worth a long trip to see it. Mr. Reeves's collection of exotics is truly grand. Here are splendid large specimens of *Eulalia Japonica Argentea*, *Bambosa Fortuni variegata*, *Sanseveira Javanica*, and many other equally rare tropical plants grown in their native luxuriance.

Among the delicious fruits of Utah, is *Rubus leucodermis*, a splendid native black Raspberry. Is it now in cultivation, and how does it do? Prof. M. E. JONES.—[Will some horticulturist who is familiar with the subject, kindly answer this question. ED. BOT. IND.]

Miss Mary C. Reynolds, who has been collecting living plants as well as herbarium specimens and seed in Florida for the past few years, has been singularly fortunate this year in securing many choice varieties of rare plants and seed which are now being distributed from Columbia College, N. Y., (see advertisement.) From her well known energy and painstaking in collecting, she certainly deserves a very liberal patronage, which we especially wish to impress upon the minds of readers.

We take pleasure in calling attention to the letter of Prof. Jones, whose large collections of Utah plants will be found a great addition to any herbarium of American flora. In fact, without some of his specimens no herbarium will be complete. He has now left Grinnell (Iowa) College, temporarily, and will devote his summers botanizing on the Pacific coast, and for the present at least will winter at Salt Lake City, Utah, where he divides his time as Professor of Botany, Geology and Chemistry in the *Salt Lake* Academy, and studying up his immense collection of plants.

Leaflets and Scraps.

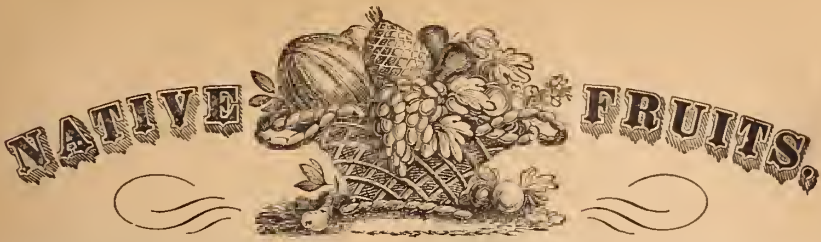
Dyervilla Japonica, Snowball and other species with pithy shoots, will only root profitably where cuttings are taken with a *heel* of softened wood coming from just under the surface of the ground or with a with stub of older wood. Still, other sorts like Spirea prunifolia and Spirea opulifolia, need to have the cuttings calloused by tying a fine wire just below a bud, in June, or else by cutting or wringing and layering them. * * Cuttings of Catalpa, Mulberry, Maple, Birch, Alder and other trees root more or less successfully, put out in autumn; but in most cases the cuttings must be so cut as to have attached the swell at the base of the shoot or a thin section of the older, firmer wood at the point of bifurcation. Cuttings should be put in very firmly at an angle of about 45 degrees with the upper bud near the surface of the ground; as cold weather approaches, a covering of prairie hay.—*College Quarterly, State Agricultural College, Ames, Iowa.*

[See our our letter from Jean Sisley, page 106. It always gives us pleasure to receive letters from this valuable correspondent, and although we have no permission to publish them we often find items in them of so much public interest that we feel justified in making extracts from them. The Postal Congress held in Paris, commencing October 6th, 1880, is a subject more particularly affecting Horticulturists than any other class of people, probably, and as there are so many reasons why their efforts should be encouraged and assisted by National legislation, we hope the entire Horticultural and Agricultural press of the country will use its best endeavors to convince the member of Congress from each District that a *postal reform is necessary.* Let us look at some of the reasons. In every part of the world new varieties of grain, fruit or vegetables are being procured of inestimable value, oftimes to the whole human family. But some will not flourish in our climate or soil, hence in some localities they are really worthless. Now the enterprising dealer who imports them usually does so at a loss, which if they prove valueless is a total one, and it was incurred as much for a common benefit as for a personal gain. Again, no one ever imports living plants, trees or shrubs, without their loss will average thirty-three per cent., caused by their perishing on the road. These drawbacks prevent to a large extent the economic benefits we all should reap by a more liberal exchange of new fruits, plants, etc. We take great pleasure in recommending M. Sisley to the consideration and patronage of the American rose dealers, with the full assurance that his past dealing has been most eminently satisfactory to his American buyers. We were grieved to learn of the death of Louis Emile Jean Sisley, a son of our honored friend, who died in Algiers, July 31st, 1880.]

PROPAGATING DRACENAS.

Last autumn I had a good plant of *D. Goldieana*, the top of which I wished to strike without the loss of a leaf, and so tried the incision and Moss plan; but after a trial of two months there was not a trace of any appearance of roots. I at once took the top off, which became well rooted in about six weks time. *D. Cooperi*, which is perhaps only a variety of *D. terminalis*, and the whole of that section may be propagated by the hundred by splitting the old stems down, cutting them in lengths of 3 inches or 4 inches, and laying them on Moss, Cocoa-nut fibre, or any moisture-retaining material in a propagating frame. I have seen a bit 2 inches long, of the stem of *D. Cooperi* with seven young plants growing out of it.—Z. B. in *The Garden.*

NATIVE FRUITS.



MORUS, (MULBERRY) TOURNEFORT.

EIGHTH PAPER.

AMONG all the different varieties of delicious fruits under cultivation or brought from a foreign land, we uniformly miss that of the Mulberry, which is certainly one of the very best dessert fruits grown, and after once planting requires no further attention than to keep the worms from devouring its foliage. All the varieties form quite large and spreading trees, and occupy no more ground than many of the commonly considered ornamental trees often seen about a residence. They are all natives of Asia (including Asiatic islands), and North America, none being yet found in Europe or Africa. There are not more than six or eight true species, according to some authors, but some species have a large number of varieties which others consider true species. The principal species, according to Joseph Paxton, are *Morus Alba*, from China, with 11 varieties, which are characterized by heart-shaped leaves with oblique bases, ovate or lobed, unequally serrate, smoothish; grows 15 to 20 feet high. *M. Nigra*, from Persia, with one variety, leaves heart-shaped, ovate, or sub-5-lobed, unequally toothed, scabrous; grows 20 or 30 feet high. *M. Rubra*, of North America, leaves cordate, often 5-lobed, equally serrate, scabrous, pubescent beneath; grows from 40 to 70 feet high. To these may be added a few more almost unknown species which, however, are valued more as a rarity than for their fruit. They are *M. Calcar-galli*, from Australia; *M. Indica*, from East India; *M. Tartarica*, from Tartary; *M. Mauritiana*, from the South Pacific, and *M. Constantinopolitana*, from Turkey. They all form trees from 12 to 20 feet high, and are quite ornamental, but in our climate would require protection during winter. *M. Alba*, is also considered a much more tender species than the black or red ones, but will stand our ordinary winters very well. *M. Nigra*, the black mulberry, was introduced into Europe over 700 years ago and cultivated for its fruit, while the white mulberry was introduced for furnishing a food (with its leaves) for the silk-worm, over 500 years ago. Both these species, and many of their varieties, are introduced quite sparingly, however, into cultivation in America, and served as the foundation for our improved varieties, such as Tom Paine, Thompson and English Black from *Morus nigra* stock, while the celebrated Downing's everbearing (Fig. 217), was raised from seed of the *M. Alba* variety *multicaulis*. This is the only worthy fruit so far as we can learn from *M. alba*; but as the fruit is so long in season it is *good enough*. The variety or sub-species, *M. multicaulis*, is in general similar to the *M. Alba*, but seldom grows more than from from 12 to 15 feet high and has enormous leaves, often from 12 to 14 inches long. The older settled portions of our county, viz: New England, New York, etc., are plentifully supplied in many a fence corner with bushes of the white mulberry that was cultivated years ago for their leaves to feed the silk-worm with, and now since "their occupation is gone" they are a great pest. But as we wish to write of the American varieties particularly, we must dismiss the foreign ones for the present.

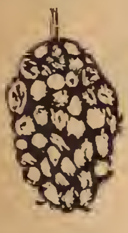


FIG. 216. *M. Rubra, natural size.*

Morus rubra, *Linnæus* is the common American form but is never a common tree; in fact they are more rarely seen than the introduced varieties. We find some old authors make mention of another American species, *Morus scabra*, but the name is now dropped and we cannot find the author's description or locality of the species. The most prominent authors that quote it are Nutall (Genera, page 207), and Sir Joseph Paxton. In Young's "Flora of Texas," Prof. Buckley gives a third American species which he calls *M. microphylla*, and describes it as follows: "Leaves cordate-ovate or 3-lobed, serrate, teeth mucronate, smooth, veins and margins slightly ciliate, stipules small, linear, membranaceous, caudacious; *fruit* ripe last of May, black and sour, with little juice and deep sinuses between the achenia, which are a little compressed, *styles* divaricate and obtuse; *leaves* generally entire, an inch or one and a half long and of about the same width; the lobed leaves about two and a half inches long, the middle lobe prolonged and acuminate. *Stem* and *branches* smooth, with a light grey bark. A large *shrub* or small tree from 12 to 20 feet high, growing in clumps on hill of Western Texas."

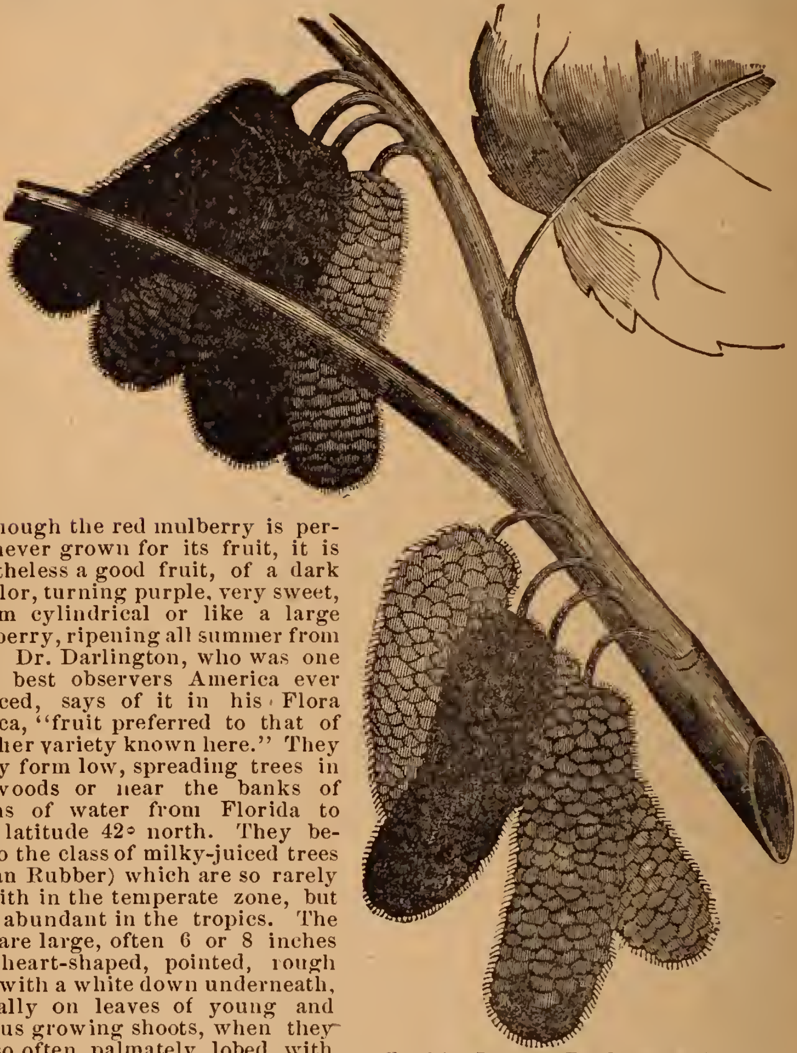


FIG. 217. *Downing's Ever Bearing Mulberry.*

Although the red mulberry is perhaps never grown for its fruit, it is nevertheless a good fruit, of a dark red color, turning purple, very sweet, in form cylindrical or like a large blackberry, ripening all summer from July. Dr. Darlington, who was one of the best observers America ever produced, says of it in his Flora Cestrica, "fruit preferred to that of any other variety known here." They usually form low, spreading trees in rich woods or near the banks of streams of water from Florida to about latitude 42° north. They belong to the class of milky-juiced trees (Indian Rubber) which are so rarely met with in the temperate zone, but are so abundant in the tropics. The *leaves* are large, often 6 or 8 inches long, heart-shaped, pointed, rough above with a white down underneath, especially on leaves of young and vigorous growing shoots, when they are also often palmately lobed with 3 or 5-lobes. *Flowers* produced in May, numerous, small inconspicuous, greenish-white, with a small 4-parted *calyx*, lobes ovate, *4-stamens*, *2-styles*, *ovary* 2-celled but one small and soon disappearing, *stigmatic* on the inner side, but each flower is arranged in an aggregate, catkin-like spike, *achenia;* mostly *monœcious*, the two kinds in separate spikes. The *staminate* spikes (the flowers of which are imperfect of course) are nearly 2 inches long, slender, drooping and soon falling off; the *pistillate* or fertile ones usually about an inch long, oblong or ovate in form, and each flower becomes a separate berry, *akene;* which is covered by the thickened, succulent calyx, bracts, etc., of the flower and becoming a compressed, ovate, juicy fruit, which, adhering to the *achenia* in a crowded mass, form a multiple fruit, which botanists term a *sorosis.* Each little pulpy nodule then, represents a separate flower, the calyx of which is the delicious fruit we all admire; "so under the name of fruit very different things are eaten. In figs it is a hollow flower-stem; in pine-apples and mulberries, clusters of flower-leaves, as well as the stalks they cover, etc."—(Gray's How Plants Grow.)

A careful inquiry among a large number of nurserymen fails to discover any good and worthy improved varieties of *M. Rubra* under cultivation, except one said to have been produced in Ohio, and distributed several years ago as the Johnson variety, with a large, blackish, sub-acid, mild and agreeable fruit; tree a strong and vigorous grower. The inquiry also fails to bring out a sufficient reason for their scarcity, the only acceptable one being, "A sufficient quantity of fruit does not ripen at one time to afford a profitable picking, a single mature tree not averaging more than 4 quarts a day, which will not answer to the ideas of a large fruit-grower."

We clip from the College Quarterly, Ames, Iowa, of September, 1880, a short article which reads: "Of the varieties we have tried, the Downing has proven the hardiest and most fruitful. We have found no difficulty in growing the fruit except that the birds take them as fast as fully matured. But this difficulty can be obviated by planting a whole row of them on the sheltered side of an orchard or timber belt. The Downing is derived from the Multicaulis species and propagates readily from cuttings put out in autumn as soon as the leaves mature. We have also grown them by grafting on our native red species, and by grafting in the crowns of small-sized osage orange plants." But perhaps the best direction for propagating is to be found in Berry's Fruit Garden, which is as follows: "Can be propagated from cutters and layers, and by grafting and inarching. We usually graft on roots of the White Mulberry, in the house, as we do grapes—put them in pots or boxes and keep them under glass until they have taken well and made a few inches of growth, when they are planted out in the open ground."

The Mulberry, containing such a large quantity of *Caoutchouc* (Indian Rubber), makes it the special favorite for the caterpillar, of many varieties, and it often requires much attention to preserve their foliage which must be attended to promptly or the tree will soon be denuded of leaves, and as a necessary result the fruit will drop off. This is all the care the trees will require after once becoming firmly established. The uses to which the fruit is adapted in addition to dessert or table use, is for all kinds of domestic purposes such as pies, tarts, canning for winter use, preserves, etc. "In many portions of Europe a kind of wine is also made from the fruit which is considered an excellent beverage. The pure juice is also used for coloring and flavoring."—(Treasury of Botany.) In early times, before the great abundance of fruit in the United States, the fruit was most eagerly sought for by all, both whites and Indians, and in the newer portion of our country, *i. e.* that portion which is sparsely settled between the Mississippi River and the Rocky Mountains, long journeys are still made for gathering the fruit.

The White Mulberry was introduced into America during the *silk culture mania* about 1750, but like many other similar speculations the project was soon abandoned and has only been partially revived at occasional intervals since. During one of these intervals, about 1825, the form, *M. Alba var. Multicaulis*, was introduced, and has proved of far more value both for its leaves, which are larger, and for its occasional fruit, which of a straw color, occasionally nearly black. Add to this the tree is dwarfer and with a very dense foliage, making it still more valuable for the doubtful value of *silk culture*. There seems to be quite an inclination manifested in many parts of the country now to again embark in the enterprise, and perhaps with the new zeal for their culture other and more prolific varieties may be obtained.

RED SPIDER IN VINERIES.

Red spider may be checked in a Vinery by sulphuring the hot-water pipes when they are highly heated, and the temperature of the house has been raised to 80 deg. Mix the sulphur to the consistency of paint, close at the ventilators and apply it at night with a whitewasher's brush. Wash it off the pipes the following morning, and ventilate before the sun strikes the roof. Repeat the sulphuring once or twice at intervals of two or three days. Examine the borders and see that they have not been kept too dry. One of the most fertile causes of red spider is dryness at the roots, and the best preventive is giving them abundance of liquid manure throughout the growing stage. It should, however, be borne in mind that a heavy drenching may do harm to the grapes now about ripe. Syringe thoroughly as the grapes are cut and properly cleanse the house and vines at pruning time by carefully scrubbing the rods, trellis, and woodwork with strong soap and water. Wash the walls with quicklime, and remove every particle of loose mulching and insert soil from the surface of the internal borders. This done, make a solution of Gishurst compound, 8 oz. to the gallon of soft water, and apply it to the rods and spurs with a painter's brush. Watch the vines closely in the spring, and should spider reappear sponge the young leaves with soapy water before it has time to spread.—*The Garden.*

NEW & RARE PLANTS
B. CASE RICHMOND IND
FROM J.V. & S. LONDON
CASE RICHMOND

[We would request any one having new or strange Plants, to send us a notice for publication in these columns.]

BEGONIA DISCOLOR-REX.

AGAIN it is our good fortune to have the privilege of publishing the descriptions of the third instalment of *Monsieur Bruant's* new hybrid, *Discolor—Rex Begonias*. In the April, 1879, number of the BOTANICAL INDEX (page 35), we gave descriptions of his varieties Nos. 1, 3, 4, 5, 6, 7, 8 and 10. This comprised all he had then in stock and would sell. In the following April number (1880, page 51,) we published a second series from his collection, consisting of his numbers 2, 11, 12, 14 and 16. M. Bruant now has a third series ready for distribution of 10 varieties, which he offers for 8 francs each, or the set of 10 varieties for 60 francs—(one franc equals 18 cents.) Perhaps we should say for the benefit of those interested that M. Bruant has a stock of the two first series (except his number 3, *B. Souvenir de Dr. Weddell*), for which he offers the 7 varieties of the first series at 4 fr. 25 centimes each; and the 5 varieties comprising his second series for 3 fr. each. In his note accompanying the descriptions dated September 10th, 1880, he says, "No. 9 and 13 of my series of seedlings are not fine enough for commerce; consequently will not be sent out. Dry bulbs can be sent through the mail to almost any part of the world in perfect safety."

M. Bruant is recognized as one of the most successful nurserymen and florists of France, and as a skillful hybridizer not only with the Begonias, but also with Petunias, Geraniums (Pelargoniums), Dahlias, etc., has few equals, and for his skill and success is the constant recipient of gold and silver medals from many of the Horticultural Societies of France, and also the honorable mention and praise of the entire Horticultural press of Europe. Add to his success as a plant grower, his very complete and painstaking manner of packing as a rule, insures success in transportation both by freight (express) and through the mails. His plants, especially of Begonias and Dahlias, sent through the mails, are grown with especial reference for his mailing trade, and travel a long distance with perfect safety.

NEW BEGONIA DISCOLOR-REX.

No. 15—Alf. Pellier,—Bruant.

Plant bushy, slender, leaves very large, fretted, of uniform color, bronze antique on the upper surface, purple underneath; differing from the beautiful variety, Ed. Andre, by its growth and form of leaves.

20—President de la Devansaye,—Bruant.

Plant very vigorous, rapid growth; the young leaves rose-purple, the older ones a dark green with purplish lead-color reflection, and pointed with white; a distinct zone around each leaf in which are disposed small silver spots; nerves deep green; reverse side of leaf lively purple; flower large, lively rose-color, very similar to those of *B. Discolor*.

21—Mrs. Nicholson,—Bruant.

Large and long leaf stock bristling with scales, supporting very large leaves of the Rex variety form, of a white color or uniform silver with metallic tint, very brilliant, large, dark green nerves; plant very vigorous, bushy stems short; flowers white-shaded carmine.

23—Klissing sohn,—Bruant.

Plant extra vigorous and magnificent, very large leaves, deep bronzy-green sprinkled with white specks, those of the centre larger and disposed in zones, each leaf having a well-defined zone similar to B. Rex; the underside of leaf clear purple; flowers large, rose-color.

24—Le florifere,—Bruant.

Plant bushy, robust, leaves large, elongated but not as thickly set as in some other species, nerves bordered with deep green, but the rest of the leaf pure white; very remarkable for its early and abundant flowering, the flowers being similar to *B. Discolor.*

25—Perle Poitevine,—Bruant.

Leaves moderate, of a magnificent metallic white, very brilliant, with rose-color reflection, and a small, dark, bronzy-green centre forming a very unique contrast; flowers, soft, rose color; a superb variety.

26—Alegatiere,—Bruant.

Large and fine leaves supported by long leaf-stocks, leaves cordiform, dark green, centre and borders violet with the remainder of leaf of a sandy white and the zone of *B. Rex* perfectly designed, underside of the leaf rosy purple; plant very tall growth and extra vigorous; flowers similar to *B. Discolor.*

29—Baronne Leroy,—Bruant.

Plant very vigorous, fine foliage, form and grandeur of *B. Discolor*, a tender green color, centre faint violet, border edged violet; all the surface regularly covered with small white points with very pretty effect.

34—Professeur Poirault,—Bruant.

Plant short, each branch also short; beautiful leaves, with a large white zone and metallic tint, the borders and the centre green powdered with white, nerves prominent, flowers, large, rose-color, in fine clusters on long peduncles.

27—Mme. J. Menoreau,—Bruant.

Leafage similar to *B. Discolor* with same manner of growth and magnificently streaked; large, clear white satin-like spots disposed in a zone, centre violet marbled white; edge clear green equally marbled with white.

42—Ed. Pynaert,—Bruant.

Leaves of good size, black-bronzy, with large pure white zone, neatly designed, surrounded with lively green on its outer edge; a magnificent variety.

BEGONIA DAVEAUANA AND LINGULARIA MACROPHYLLA.

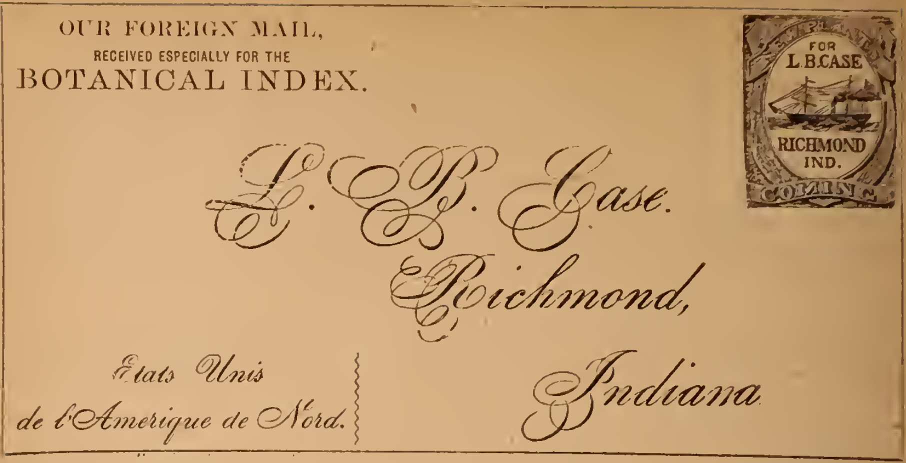
These were exhibited by M. Godefroy Lebœuf at a recent meeting of the French Horticultural Society. The former is a plant of small dimensions with beautifully colored foliage. It grows well in the shade, not becoming drawn when thus circumstanced. It is a native of the mountains of Badong, in the Gulf of Siam. Lingularia macrophylla belongs to the Compositæ, and attains large proportions, the flower-stems rising from a tuft of large oval, oblong leaves to a height of over 6 feet. The flowers are yellow. It is a native of Central Asia.—*The Garden.*

BEGONIA FRŒBELI INCOMPARABILIS.—FRŒBEL.

This is a cross between *B. Frœbeli* and *B. Polypetala*, (a brilliant new species as yet only in possession of the introducer, *Herr Otto Frœbel, Zurich.*) Its growth is much stronger than that of the type, *B. Frœbeli*, while the leaves, the petioles and the flower-stalks are of the same large size as those of *B. Polypetala.*—OTTO FRŒBEL, in *The Garden.*

A NEW LILY.

Mr. C. H. Allen, of Garden City, New York, while collecting native Lilies in the Berkshire Hills of Massachusetts, found two clumps of double-flowering *Lilium Philadelphicum.* The flowers were in all respects similar to that species excepting in the large number of the petals, which are numerous as those of the *L. Tigrinum fl. pl.* When he saw the first one he supposed it a twin flower, but upon examination, finding the several bulbs in each clump producing the same double flowers, the conclusion was that they were a distinct variety, likely to prove constant. We shall watch the flowering of these Lilies another season with much interest.



OUR FOREIGN MAIL,
RECEIVED ESPECIALLY FOR THE
BOTANICAL INDEX.

FOR
L.B.CASE
RICHMOND
IND.

L. B. Case.
Richmond,
Indiana

Etats Unis
de l'Amerique de Nord.

St. Thomas, W. I., Aug. 18, 1880.

L. B. Case, Richmond, Ind.—*Dear Sir:* It will give me great pleasure, if in the coming number of the Botanical Index, which I peruse with great interest, and which I think of great value both practically and theoretically, you would inform your readers of the proposed, and already begun, exploration of the West India Islands, which I have lately undertaken, especially as far as the botany of this archipelago is concerned, having for a number of years made a particular study of the botany of the islands of Santa Cruz and the Virgin Islands, a treatise on which was lately published by the Smithsonian Insititution in Washington. I now propose to extend these investigations, which, besides tending to collect new species of plants, also have for their object to define the geographical distribution of the species over the various islands, and in other respects to elucidate the phytogeographical phenomena, to others still very little known islands, especially Porto Rico, Hayti, Dominica and Trinidad. Having trained collectors with me, I am prepared to offer sets of plants for herbariums to botanists in the United States for $10 a hundred species; also collections of named woods for $15 the hundred species, and of fruits and seeds for $8 the hundred. Applications for these collections, which no doubt will be acceptable to botanists and amateurs, may be sent to the Curator of Harvard University Museum, Cambridge, Mass., who will receive the same and have them forwarded to me. The first set of one hundred species of prepared West India plants is alreadyready for distribution. Yours Truly, EGGERS.

Cape of Good Hope, July 20, 1880.

Mr. L. B. Case—*Dear Sir:* I beg to acknowledge with thanks your very kind letter and the various numbers of the Botanical Index, and was much interested in looking over the numbers from the commencement in noting the gradual development of the Index from a mere trade catalogue into a beautiful magazine. I very much admire the front cover of the Index. I was much interested in the various articles on the Native Fruits of America, also in the articles on the Chinese and Japanese Pears, and the Diospyros Kaki. I should very much like to send for the varieties of the Diospyros to be had in America, but unfortunately by a late order of the Governor and Council, no plants are allowed to be introduced for fear of bringing the Philloxera, of which we are as yet free. So stringent is the rule that not only live plants but even bulbs and tubers are prohibited; potatoes are not exempt, so we may sigh in vain for your Beauty of Hebron or Late Rose. I must procure the Rev. Lomis's work on the Diospyros.

Perhaps a few rough notes on some of our common plants may interest you. The Calla Lily, *Richardia Æthiopica*, is very common here, fringing all the streams and growing in moist places, but very rarely growing in the water; it flowers all through the winter. The spotted-leaved variety is much less common and grows on the hills, generally among or at the foot of rocks. I have never met any growing near water.

A very common plant here is the Red Hot Poker or Flame Plant, the *Tritoma Uvaria*, which grows near the foot of low hills near the coast; but up-country where the climate is drier it is grown in moist places and beside streams. Another common plant near the coast with handsome foliage, the *Strelitzia Regina*, with flowers of blue and orange and red, resembling some gay bird.

We have two varieties of *Erythrina* here; the one is a deciduous tree of about 20 feet in height; in the spring, while still leafless, it is one mass of scarlet. The other is a small plant and has also scarlet flowers, but they bloom in the autumn. Another variety which grows up-country in the Queenstown district, grows a dense but thorny bush, which is known as the Cat-thorn, as the thorns are very like cat's claws. This variety dies down to the root-stock every winter. The roots are very large, six inches or more in diameter, and of a ash-like substance.

Gladiolus-like plants are very numerous. The Red Watsonia lately figured in the English 'garden' covering hundreds of acres.

One notable feature in all the 'Kloops' or bushy ravines, is the Giant Euphorbia, growing to the hight of 30 feet, looking very much like an immense Cactus, but containing a very acrid, milky juice, which is as yet only used as a blister for stock, but may some day be utilized as an Indian rubber. The flowers are small, yellow and inconspicuous, but in their season the honey of the wild bees is apt to be uneatably hot and acrid.

Pelargoniums, one of the glories of the South African flora, are by no means plentiful in this part; a few of the herbaceous and tuberous-rooted section together with one ivy-leaved variety being all that are found here. In the Western district of the Colony they are much more numerons and varied. It is the same with regard to Heaths; only one, a scarlet flowering variety, being found here, while from Grahamstown westward they become very numerous and varied.

In the last number of the INDEX, I see a description and cuts of the Japanese Quince. I have had the plant a number of years, but the climate does not seem to suit it as it grows but little, flowers less, and never fruits at all.

I remain, Dear Sir, Yours Truly, HENRY GOLDING.

WELLINGTON, NEW ZEALAND, July 14th, 1880.

My Dear Sir: Many thanks for your kind letter and copy of your January number of the BOTANICAL INDEX, as I think it a very useful publication, and will endeavor to find a means of remitting the subscription. We do not have many Liliacæ here. I enclose you some seed of the native Lily ringa ringa, *Arthropodium cirratum.* It bears small flowers in large clusters, and is very pretty. I also enclose a little seed of an Ourisia, which I discovered in the interior when traveling near a waterfall, and I find it requires plenty of water and shade. My work here is endeavoring to introduce and acclimatise new fruits and medicinal plants, and I am anxious to obtain all the fruit-bearing trees I can from your favored country, as I believe many of them could be introduced with great advantage here. All the walnuts and hickories would, I feel satisfied, succeed. I also want the cranberries and numerous blackberries, black-cap raspberries, and indeed any seeds I can obtain. We have many fine evergreen trees but no native fruits worth cultivation that I have tried. Several bear an edible berry. The Kiekie, *Freycinetia Yanksii*, a very lofty climber, bears the best edible fruit, but the seed is very difficult to obtain.

I am, My Dear Sir, Yours Faithfully, WM. CURL, M. D.

MONPLAISIR, LYON, FRANCE, 27th October, 1880.

To MR. L. B. CASE, Richmond—*Dear Sir:* Your paper at hand. * * * You have most likely been informed that a Postal Congress was held in Paris on the 9th of this month, at which assisted delegates of all the European powers. The object was to discuss the convenience of increasing the size and weight of parcels sent by post. And, although the result is not yet published, it is certain that a great improvement has been agreed upon. This will be favorable to Horticulture, as the cost of sending small parcels prevailing is relatively great. It is only a pity that there were no American delegates. But it is to be hoped that your Government will adhere to the convention. As soon I shall know the new tax I will inform you of it, expecting that you will make it known and plead warmly for its adoption for your country.

Be pleased not to forget that one of my sons grows Roses for sale, and that it is now the time to send orders. You know, as before said, that the Roses grown here are budded in autumn by dormant buds, on the seedling brier of one year old, and left for one year growing in the open air, which makes of them very stout plants, but for immediate plantation and also for pot culture, and in both respects preferable to young plants on their own bottoms from cuttings. They also stand a long journey much better. I have lost all the young roses I received from your country per mail, although carefully packed and good care was taken of them on their arrival; and although Peter Henderson sent me three times American banner, I do not yet possess it. All the roses my son sent to different parties in your country arrived safe and thrived perfectly.

Hoping to hear from you soon, I remain, Yours Devotedly,

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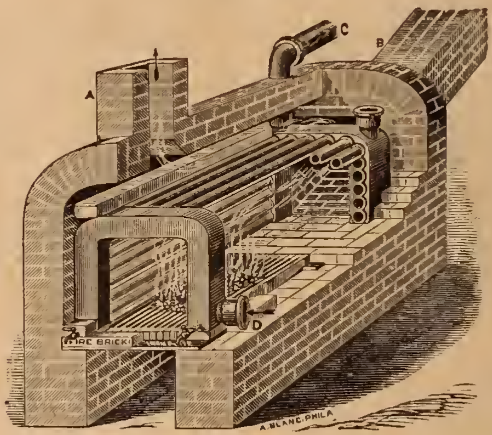

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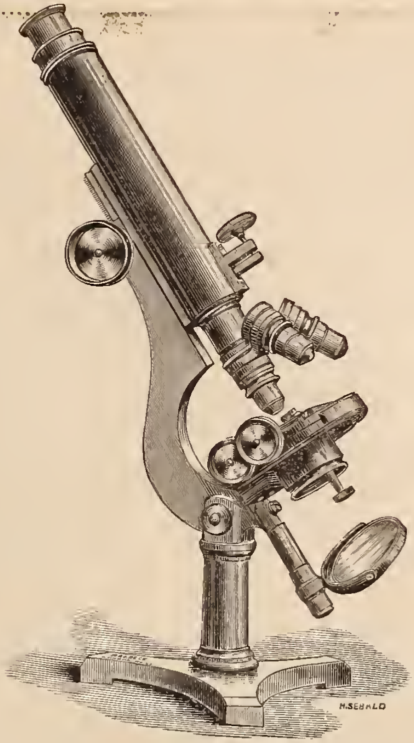

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We shall publish the BOTANICAL INDEX Quarterly, as heretofore, at 50 cents a year, issuing each number as near the commencement of the four seasons as possible, and shall endeavor to gather information for its pages of special interest to *the Dealer, the Gardener and the plant loving public* in general. Our location being central, in the *great inland basin* of the *United States*, popularly known as the *Western States*, we have an *extra fine field* to gather from, and with the many friends interested in our success, we feel warranted in promising *increased attractions for 1881.*

The series of papers on the Water Lilies, published in the BOTANICAL INDEX for the past two years, will be continued in Vol. IV., and no pains will be spared to make them as interesting and instructive as those of the past, which we are pleased to see so fully appreciated. The series of articles on our Native Fruits, will also be continued, and as we are promised contributions by some of the best Horticulturists in the country, we feel safe in announcing a series of articles of permanent value and great interest. All these articles will be fully illustrated, which will add much to their value.

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